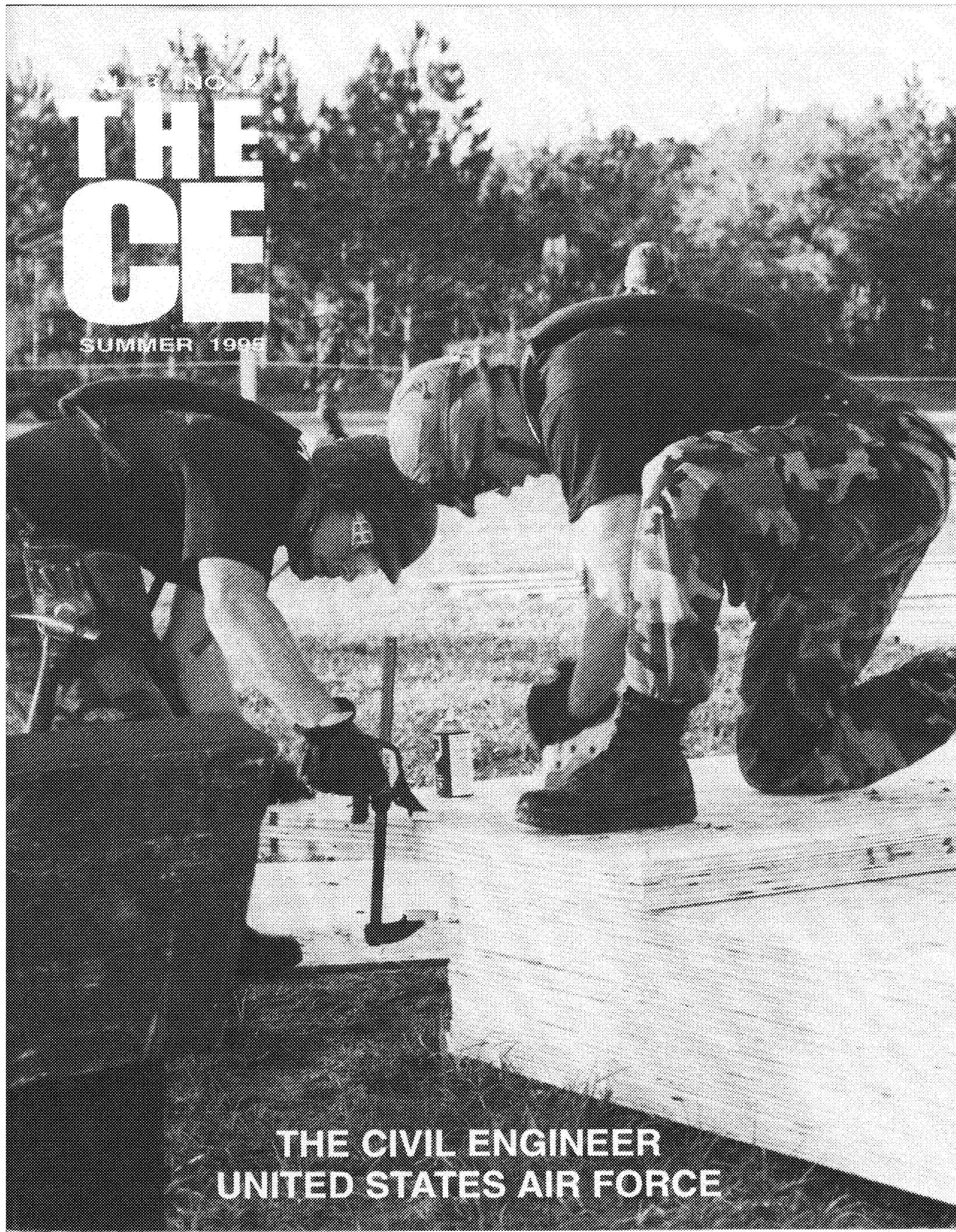


THE CE

SUMMER 1995

THE CIVIL ENGINEER
UNITED STATES AIR FORCE

Cross-training goals set for careerists

It's been a year now since the first Civil Engineer Career Program (CECP) Policy Council meeting. I'd like to give you a status report on where we are and more importantly, where we are going, with particular emphasis on training and development of our people.

At the July 1994 meeting, the council adopted the following vision: **Provide policy and guidance to assure a diverse, highly-trained, -qualified, and -motivated team of managers and leaders to perform the Civil Engineer mission—today and in the future.** We should measure our progress against that vision.

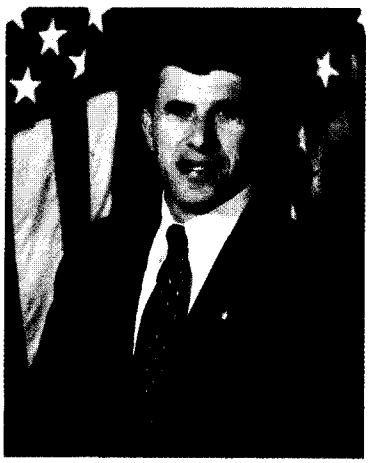
With regard to diversity, the council itself is now a more diverse group than in the past. We have expanded our membership to not only include women and minorities but at least one representative from each of the functional areas within the civil engineer organization. The diversity of our council is paying dividends in getting all points of view involved in the process.

We have better organized our process to advertise and select people for mid-level management courses. The Career Enhancement Plans are important tools in having our registrants and their supervisors identify needed training, but the system does not provide the best means of selecting individuals to attend courses. We are attempting to announce our course offerings via E-mail so that our registrants can more easily learn about these opportunities and apply.

We initiated a cross-training opportunity for some careerists to attend the Air Force Institute of Technology Resources course. The feedback has been good and we will continue to offer a limited number of slots twice a year. We also initiated a four-month detail to the Headquarters, U.S. Army Corps of Engineers for our registrants involved in management of our military construction program at the major command level. Two individuals have completed this assignment and we will soon announce another four-month detail. We initiated an Executive Mentoring Program for deputy base civil engineers. Each person selected spends two weeks with the deputy civil engineer in the Pentagon. Two deputy BCEs have completed their sessions; others will be selected based on major command nominations.

The council also initiated a full-time graduate education program this year for a selected number of registrants to attend a local college or university; we allow up to one year to obtain a masters degree. We were also successful in having a number of registrants selected for Professional Military Education course and the Federal Executive Institute.

A major success has been the development and issuance of a policy on the 028 Environmental Specialist occupational series. After much work and debate, the policy was issued in October 1994. To better train and develop our environmental workforce, we decided to get our people who are currently in 028 positions converted to one of the professional series covered by the CECP or to provide them the education and job experience required to make the conversion. We created a panel to review more than 400 GS-11 and above workers in the 028s series who desired conversion. Each applicant has now been notified of the results of the panel action and supervisors should be forwarding the evaluation package to the local personnel flight for conversion, requesting tuition assistance from the career program or working new responsibilities into the position.



Dr. Robert D. Wolff
Deputy Air Force Civil Engineer

What about the future? We are at the initial stages of planning for several other programs. One is the Executive Mobility Program (EMP), which is designed to create opportunities for a selected number of GS-15s and GS-14s to move into key positions to enhance their opportunities for promotion and to provide our senior civilian civil engineer leaders with greater diversity of job experience. The first EMP position was filled this spring in the headquarters, and we look forward to filling more in the coming years.

The council is investigating a method to implement the "whole person" into our selection process. Under the current system, registrants are scored based solely on job experience. In the future, we would like to include performance appraisals, education, training, professional engineer registration and other professional certifications in the scoring process. Other Air Force career programs already have such a system in place. It will take us about two years to develop and fully implement the new system.

The council will also be establishing new guidelines for environmental positions which require professional architect or engineer registration and certifications. Through the Air Force Civil Engineer Support Agency, the council has conducted workshops to develop a Career Field Education and Training Plan for each of our major functional areas in which the civilian workforce plays a major part—engineering, environmental, fire protection, housing and realty.

The council, with the valued assistance of Mr. Refugio "Chico" Fernandez and his staff at the AF Civilian Personnel Management Center have established a new network of liaison personnel at each base to better communicate our programs and obtain feedback from you, our valued customers. We sent a request to the MAJCOMS to get people identified for this volunteer duty—the response was outstanding. We are planning two workshops to train our liaison personnel, one in August and one in October.

And finally, the policy council will meet again in August to continue its efforts to achieve its vision, goals and objectives of making the civil engineer team the best in the Air Force.

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The Civil Engineer
Summer 1995 Volume 3, Number 2

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The Air Force Civil Engineer Maj. Gen. James E. McCarthy conducts an interview at Readiness Challenge V.

by TSgt. Andra Higgs

Readiness is job one

Responsible for organizing, training and equipping the 50,000-person civil engineer force since 1992, the Air Force Civil Engineer Maj. Gen. James E. McCarthy retired from active-duty July 21, 1995. Recently, McCarthy spoke with Air Force Civil Engineer Support Agency Historian Dr. Ronald B. Hartzer to reflect upon team successes and highlights during his 33-year career. During times of budget cutbacks, force drawdowns, base closures and many deployments, readiness was pressed as base civil engineers were asked to do more with less. McCarthy endeavored not just to lead civil engineers toward coping with changes, but to see that the Air Force CE community excelled. His visions of interactive video training systems to guide the knowledge agenda for squadron-level personnel are becoming reality. Commenting on matters ranging from new technologies for cleaning up hazardous waste sites to preservation of natural resources, McCarthy has been committed to pushing civil engineer issues to new heights. His congressional testimony on quality of life issues have kept matters such as airman housing and dormitory construction and renovation high on the budgetary forefront. In a parting message to the troops, McCarthy offers insights on how civil engineer organizations can be training squadrons as well as action squadrons. The general says management and workers can collectively achieve and maintain that goal by utilizing their capability, adaptability, flexibility and motivation.

Maj. Gen. McCarthy addresses AFCESA at commander's call.

Dr. Ronald B. Hartzer: **Looking back over the years you have served as The Air Force Civil Engineer, what in your view have been your biggest successes?**

Maj. Gen. James E. McCarthy: Let's not talk about my successes; let's discuss team successes. I have been very fortunate to serve the Air Force and my country for 33 years and to serve on such a fine team. I think the success civil engineers have enjoyed over the last five or six years has been remarkable because it occurred during a very dramatic and difficult period — downsizing our Air Force, our budgets, our organizations. When I came on active duty there were almost 900,000 active-duty people. We will soon be down to 383,000—an almost 60 percent reduction during the time I have been in the Air Force. Since 1988 or 1989, we have lost a third of our people; we have changed commands; we have dealt with the Selective Early Retirement Board and the reduction in force programs and voluntary "out" programs for the enlisted force.

Despite all of this, the Air Force CE men and women kept their eyes on the mission. We had a war during this period—we've had the largest-ever overseas deployment in peace time. Today, we have approximately 1,300 civil engineers deployed to various places—TDY to Bosnia, Guantanamo, Saudi Arabia, Kuwait and South America. Yet throughout this period, our people have kept their eyes on the mission and are still providing superb service to their wings and centers. In fact, just the other day Adm. Jack Buffington, my Navy counterpart, came back from visiting Guantanamo and he made a point to single out how much respect the Navy Seabees have for RED HORSE down there, their capabilities, their adaptability, their flexibility and their motivation. So, I would say the success of the CE men and women has been our ability to maintain our focus on the mission and not get distracted by all this downsizing. I think that's the single biggest success we have had as an Air Force team the last five years — we've never lost our commitment to mission and readiness.

Dr. Hartzer: **You have often been quoted as saying "Readiness is job one." Looking back on the last several years, you mentioned the war and the deployments we've had in peace time, at the same time all this has been going on, Air Force civil engineering, both Prime BEEF and RED HORSE, have gone through restructuring and downsizing - do you feel civil engineers are better prepared now for their contingency mission?**

Gen. McCarthy: We've had to cut back on some of our deployment training at Silver Flag. We've reduced the number of people that come to Silver Flag in order to focus on the specialized equipment that they don't have a chance to become familiar with back home. The part that worries me a little bit is that we have had to ask the

". . .housing is an important quality of life issue, but not the number one issue. Number one is compensation. I firmly believe that a good pay raise can increase anybody's quality of life."

Maj. Gen. James E. McCarthy

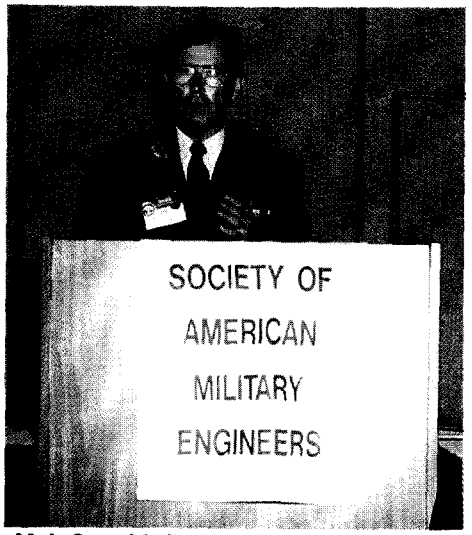
wings to do more of the training back home, things like bivouac training and the sanitation training. And this is at a time when we are asking the base civil engineer to do more with less in the normal base support mission, but our people continue to do a miraculous job. To just give you one anecdote, Gen. (Ronald R.) Fogleman, the Air Force chief of staff, visited Saudi Arabia, Kuwait, Turkey and Italy in December. After Saddam Hussein's latest stunt, we had just put some forces back into Kuwait at Al Jaber. The base was initially in horrible shape, but the civil engineers, who happened to be from Fairchild AFB (Wash.), were doing a spectacular job of making sure the people who lived there were getting the best support possible. Gen. Fogleman said that the civil engineers were real heroes to the troops stationed at Al Jaber. So when I hear stories like that, I say "Yes, we're ready! We're ready!

Dr. Hartzer: **We just finished Readiness Challenge V, what do you see as the value of this competition?**

Gen. McCarthy: Readiness Challenge V was the most successful one yet. I hope that Readiness Challenge VI is even more successful. Readiness Challenge showcases the capability of Air Force CE and services people to accomplish their mission; it lets the rest of the Air Force and the rest of the world know we are ready. I think Readiness Challenge also serves as a source of motivation for the individual units back home. Everybody gets behind the teams during the competition — wing and even major command commanders show up. I think the real value of Readiness Challenge, again, is showcasing the technical capabilities and teamwork of CE and services. It's a fun thing to witness and to go through. I still have the 3-minute clip that Combat Camera did on the young Reserve firefighter from Missouri that had his wife, his daughter and his mother here for Readiness Challenge. His mother's comments were spectacular when she said, "I think it's great that these men can come and compete in this sort of thing—Keep 'em sharp. Keep 'em alert. Keep 'em ready." I think the guy was kind of scared that his mother would get after him if he didn't do well. What a recruiting spot that is!

Dr. Hartzer: **Perhaps one of the biggest changes that has affected civil engineers at the base level has been the "objective squadron" concept. In your estimation, has this been successful, particularly in light of the declining manpower situation?**

Gen. McCarthy: The objective squadron was part of Gen. (Merrill A.) McPeak's Objective Air Force. It came just about the time that force reductions caused us to give up 6,000 military spaces. The objective squadron initiative was fortuitous in my view, because it helped us go through this terrific cut in manpower in as orderly a fashion as we could. We reengineered our squadrons to remove layers of supervision to organize our crafts people by task. We had been organized by craft since 1965 because of the enlisted promotion system in those days. The promotion system's changed, but we never changed the organization. We essentially had unions—the electrical union and the carpenter union. Now we are organized by task, which brings the skills together on the event instead of on the skill. My view is that the arrival of the objective squadron and the way we jumped on it as an Air Force civil engineer team, led by the agency (Air Force Civil Engineer Support Agency), really helped us deal with these cuts instead of just sitting back and saying "Woe is me, we have another cut." We did some smart things to help us deal with that. I think that is one of the things that has kept us going during this period.



Maj. Gen. McCarthy takes part in a SAME meeting.

Dr. Hartzer: **During your time as the civil engineer several major initiatives in the training area have been undertaken to increase the productivity of the civil engineering work force despite the cutbacks. Are you satisfied with the advances that have been made?**

Gen. McCarthy: I'm happy, but I am not satisfied. Our squadrons and the men and women at AFCESA have done some outstanding work in training. The reason for all of this is not just because we love training; the reason is that we are going to get even smaller and cannot afford to have employees, military or civilian, who aren't as well trained as we can possibly make them. Until a few years ago, it was almost a given that a CE squadron was a training squadron, as well as an action squadron. Probably one-third of our people were in upgrade training.

I won't be satisfied until all of our skills have an interactive video training system in the squadron that allow our people to do their upgrade training and do their SKT (Speciality Knowledge Testing) preparation at the same time. We are still running two systems: the system that gets you promoted; and the system that increases your proficiency. That is not cost effective. We are leading the way with the power production AFS (Air Force Specialty) as our demonstration project. I think the new training concept has productivity benefits, motivation benefits and wartime capability benefits that we have yet to realize.

Dr. Hartzer: **The environmental program certainly came to the forefront with Gen. McPeak. In your opinion, has the Air Force met the challenge?**

Gen. McCarthy: Without a doubt, the Air Force has met the challenge and I have been pleased to have been part of it. I couldn't spell environmental when I got to Washington (D.C.) in 1989, and Maj. Gen. (Joseph A.) Ahearn told me my job was to build an Air Force environmental program. At the same time, Gen. McPeak, the new chief of staff, arrived and that was a godsend because you can't implement any program in the Air Force without leadership at the top. His leadership and his attention to this had a positive influence on the MAJCOMs and wings. Suddenly, the Air Force leadership decided that environmental performance was just as important as mission performance. Since then, we've enjoyed amazing success, although we still have a lot to do. The restoration program on our 4,000-5,000 hazardous waste sites is moving forward rapidly. We've completed work on 40 percent of our sites. Our budget is being cut, but the Air Force Center for Environmental Excellence (AFCEE) will continue to provide the technical services and bring new technology to bear to

See McCarthy, Page 42

Tinker engineers aid Ok

The Alfred P. Murrah building after the bombing in Oklahoma City.

lahoma rescue efforts

by Larry Belcher
Tinker AFB Public Affairs

Twenty-five minutes after the April 19 bomb blast in downtown Oklahoma City, Tinker AFB civil engineers and firemen were preparing their emergency response to what has been called "the deadliest act of terrorism on American soil."

Within hours after the blast more than 100 volunteer uniformed and civilian civil engineers and firemen were at or near "ground zero" to deliver much-needed equipment and to help in the search for survivors in the aftermath of the Alfred P. Murrah building disaster.

"The telephones went out so we didn't know exactly what had happened at first," said Tinker Fire Chief James Goodbread. "Then we heard the call on TV for rescue workers and ambulances. We responded at around 9:30 a.m. with a rescue team and two ambulances," said Goodbread, who sent 56 men to the scene that first day.

Goodbread said he dispatched a 10-person rescue team at 10 a.m., a 16-person team at 11 a.m. and another 30-person team by 2 p.m. "We had to call in our off-shift people so we could keep our 21-person minimum to cover the base and still help downtown," he said.

"We went to five four-person teams, then four four-person teams there," said Goodbread who balanced his time between Tinker's disaster control group and the Oklahoma City command post.

"Oklahoma City firefighting officials knew our people were trained in this type of rescue effort. They call on us frequently," he said.

While Tinker firemen were fighting fires in the vicinity of the Alfred P. Murrah building, members of Tinker's 72nd Civil Engineer Group were organizing and collected supplies and equipment for transport.

"We dispatched an 11-person team which arrived downtown at about 4 p.m. That group took generators and lights to aid the work at night and other equipment to remove rubble," said Maj. Adrian Upshur, 772nd Civil Engineer Squadron commander.

"We've had a 30-person team made up of volunteers downtown on Thursday (April 20). They worked eight to 10 hours a day but, when they actually worked inside the structure, they only worked two hours at a time," he said.

Upshur stated that each of his personnel were briefed on what to expect before they went on shift and were required to speak to a mental health professional at the end of each shift. "Our people hadn't experienced anything like that before and more than half of them are young. It's important for us to consider their mental as well as their physical safety."

Volunteer crews continue to search for possible survivors.

Defense personnel killed in bomb blast

by Linda D. Kozaryn
American Forces Information Service

When President Bill Clinton visited the site of the April 19 Oklahoma bombing, an airman shared his grief with the commander in chief.

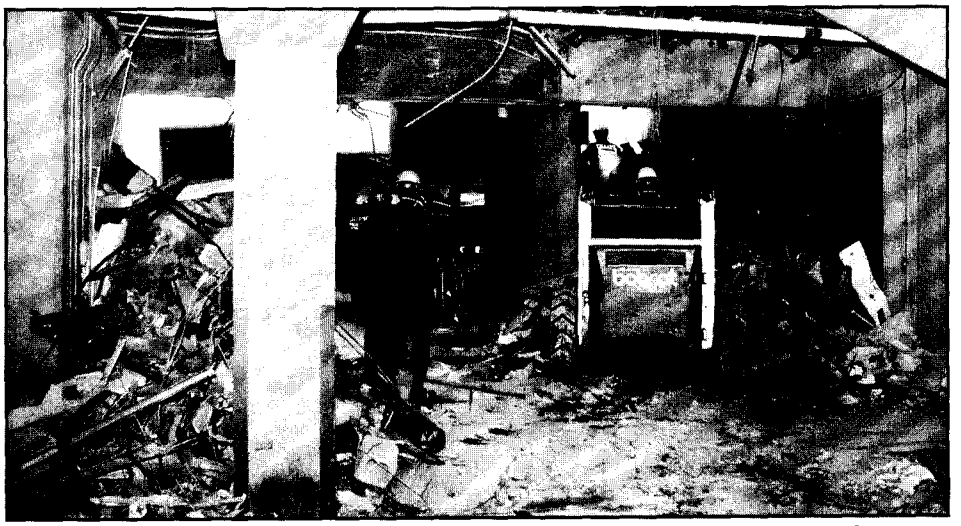
The young man "took out two pictures his wife had taken of me just three weeks before when I visited our troops in Haiti," Clinton told a Minneapolis audience April 24. "She was one of those troops, but she came home because we wound down our mission there and she married her fiancé. Three days later she went to the federal building to change her name."

SrA. Anthony McRaven's bride, A1C Cortney McRaven, died after a 4,000-pound bomb ripped apart the Alfred P. Murrah Federal Building. McRaven was one of two Air Force members killed in the blast. Two Marines, two Army sergeants, 10 civilian employees and the child of a soldier are also confirmed dead.

Air Force officials say a second airman, A1C Lakesha R. Levy, died in the blast. Both airmen were assigned at Tinker AFB, near Oklahoma City.

The body of Marine Capt. Randolph A. Guzman, 28, was found in the rubble April 24. The Marine Corps Recruiting Station executive officer reportedly was found seated at his desk. The body of Marine Sgt. Benjamin L. Davis, 29, an operations clerk, was also found at his post in the station.

"A group of New York City firemen who also serve the nation as Marine reservists were reported to have taken charge of the situation when Guzman's remains were discovered," stated a Marine Corps headquarters spokesperson. "After they removed Guzman from the wreckage, they draped a U.S. flag over his body and lined up at attention and saluted as he was carried from the federal building."



Civil engineers use a Bobcat excavator to remove rubble from the garage of the Alfred P. Murrah federal building after the bombing.

Sixteen Marines and one civilian were assigned to the sixth-floor recruiting station. In addition to the two Marines known dead, four Marines and the civilian were hospitalized.

Defense Department officials said 33 soldiers and 15 civilians were assigned to the Army's Oklahoma City Recruiting Battalion headquarters.

Army Sgt. 1st Class Lola Renee Bolden, 40, a single parent with three children, was killed in the explosion. Army Sgt. 1st Class Victorian Sohn, 36, was also killed.

Army civilians John Moss, 50; Wanda Watkins, 49; Deloris Stratton, 51; Peggy Holland, 37; and Karen Carr, 32, died in the explosion. Two-year-old Kala Haddock, stepdaughter of Sgt. William Titsworth, was also killed.

Five members of the Defense Investigative Service also died in the blast; Robert G. Westberry, 57; Harley R. Cottingham, 47; Peter L. DeMaster, 44; Larry L. Turner, 42; and Norma Jean Johnson, 62.

DOD prohibits participation in violence-prone groups

by Linda D. Kozaryn
American Forces Information Service

Defense Department regulations prohibit service members from participating in violent extremist groups. In the aftermath of the April 19 Oklahoma City bombing, Defense Secretary William J. Perry has asked the service chiefs to remind commanders of these regulations and the need to monitor compliance.

"This should not be read as any sort of indication that we have evidence that these regulations are not being complied with," said Ken Bacon, assistant secretary of defense for public affairs. "It's just an appropriate thing to do in light of what happened, just as it's appropriate to check out the security of buildings after an event like this."

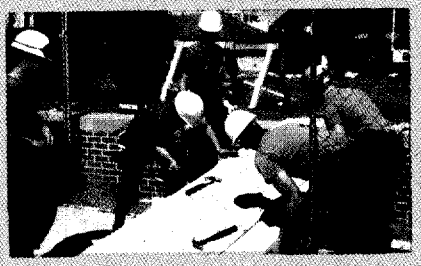
Service members swear to support and defend the Constitution against all enemies, foreign and domestic. Participating in extremist groups advocating supremacist causes, illegal discrimination or the use of force to deprive individuals of their civil rights is prohibited by Defense Department Directive 1325.6. Each service has its own regulations or instructions to implement the DoD guidelines, Bacon said.

The Defense Department directive says, in part: "Active participation, such as publicly demonstrating or rallying, fund-raising, recruiting and training members and organizing or leading such organizations is incompatible with military service an is therefore prohibited." Commanders can separate or otherwise discipline military personnel who actively participate in such groups.

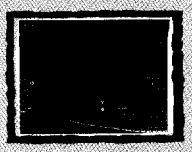
Defense Department components keep a classified list of violence-prone groups who have demonstrated intent against DoD targets - for intelligence and counterintelligence purposes, Bacon said. As a result of the bombing, Defense Department counterintelligence officials will work with the services and the FBI to determine if the list warrants updates or changes, he said.

CE Responds

Civil engineer response to support rescue efforts following the Oklahoma City bombing was swift and included among other things the following items.



Personnel
22 Civil Engineering personnel
154 Firefighters from various units
Nearly 1,000 volunteers



Vehicles
4 Fire Vehicles
35 Vehicles (Cargo, Fuel, Buses)
2 1.5-ton Trucks
1 6-passenger Truck

Heavy Equipment
2 Bobcat Excavators
1 5-ton Dump Truck
14 Towed Vehicles
26 Prime Mover M-Series Vehicles

Tools
10 MEP 5 Generators
18 LIPPS Generators
1 Air Compressor w/Jackhammer
4 K-12 Industrial Saws
3 Light-All Kits
20 LMR Batteries
2 Battery Chargers
6 Entrenching Tools
380 Pairs Leather Gloves
11 Hard Hats
30 Web Belts
Assorted Handtools

Miscellaneous
8 Water Buffaloes
1 GP Large Tents
21 GP Medium Tents
100 Exterior Light Kits
10 Interior Light Kits
8 Flood Lights
1 Giant Voice System
84 Sleeping Bags
100 Flashlights & Batteries
22 Tent Heaters
42 LMR Radios & Batteries
5 Darnell Tents
4 Field Shower Units
40 Folding Chairs
42 Full Respirators
100 HIPA Filters
200 TVEK Chemical Coveralls
40 Level-B Lifeguard Chemical Suits
20 Half-face Respirators
2 Decon Showers
40 Gortex Pants

Fire claims two Sheppard firefighters

Two Sheppard AFB, Texas, firefighters were killed early the morning of June 11 at the scene of a fuel-tank fire in Addington, Okla., approximately 40 miles northeast of Sheppard.

Richard Hogan of Wichita Falls, Texas, and A1C Christopher Rezac of Mesa, Ariz., were pronounced dead at 3 a.m. by the Oklahoma deputy medical examiner.

"We have very professional, dedicated firefighters at Sheppard and they want to respond anytime it's appropriate to help out our neighbors..."

The firefighters died when a 55,000-barrel fuel tank about 150 yards away from the men ruptured, engulfing them in a wall of flames. They had been part of a Sheppard team including six firefighters, a utility truck towing a foam trailer, and a P-19 dispatched to assist area firefighters with the blaze. The P-19 was also engulfed in the fire and destroyed.

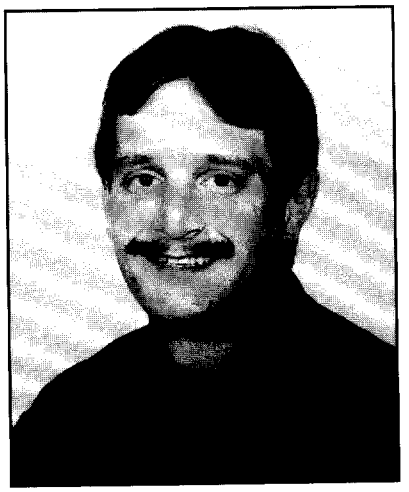
Initially four Sheppard firefighters responded to a request for assistance and arrived at the scene around 10 p.m. June 10 with a truck towing a trailer carrying 1,000 gallons of liquid foam agent. An hour later two additional firefighters were dispatched to the scene with the P-19 pressure pump and a tank carrying 1000 gallons of water and another 130 gallons of foam agent.

"We have very professional, dedicated firefighters at Sheppard and they want to respond anytime it's appropriate to help out our neighbors," said Col. Michael Zettler, 82nd Training Wing commander, "...and our response is the right thing to do."

Sheppard is one of the few fire departments in the area with foam capability, which is especially useful in fighting structural and petroleum product fires.

An Air Force safety board has convened to investigate the Sheppard casualty's portion of the fire. **(AFNS)**

A1C Christopher Rezac



Richard Hogan

CIVIL ENGINEERS IMPLEMENT REVISED DOCTRINE

by Dr. Ronald B. Hartzer
AFCESA Historian

"Doctrine is dynamic and must be updated periodically. This continual updating keeps Civil Engineering Combat Support Doctrine 'alive' and relevant to the engineer's wartime mission." These are the closing words of AFM 3-2, "Air Force Civil Engineering Combat Support Doctrine," published in 1991. They present a challenge to Air Force civil engineers to keep their doctrine fresh. It was this same concern that prompted The Air Force Civil Engineer, Maj. Gen. James E. McCarthy, to initiate a thorough review and updating of our doctrine. This has been done and the new version of doctrine is available as Air Force Doctrine Document 42, "Civil Engineer."

Doctrine is a compilation of what the Air Force holds true about civil engineers and guidance on the best way to do our job. It is based on experience and what we have learned from that experience. While not a set of hard and fast rules, it provides a sound basis for decision-making.

WHY CHANGE?

AFM 3-2 was a landmark for Civil Engineering and Air Force Doctrine. It was both the first doctrine for Air Force civil engineers and the first functional area doctrine manual. The manual was the product of a lengthy research and analytical process over a two year period. Written in 1989/90, the manual's focus was clearly on the Cold War, a European scenario and base recovery after attack activities. Only wartime and contingency operations were addressed and civilians were included only after a heated discussion with the doctrine folks.

Even as the manual was progressing through its final stages of approval and the Air Force publication system, massive changes were on the horizon—the fall of the Berlin Wall, the end of the Cold War, the drastic downsizing of the military, the reorganization of Air Force Civil Engineering, and the Gulf War.

The Gulf War was an interesting test for the new doctrine, because it would challenge the validity of the precepts in a new setting. Although the former doctrine was written with a different type of conflict in mind, the doctrinal precepts proved to be relevant because they were based on decades of engineering experience. In my article, "Validating Air Force Civil Engineering Combat Support Doctrine in the Gulf War" in *Airpower Journal* (Summer 1994), I presented a thorough analysis of engineering doctrine based on the Gulf War and concluded that our doctrine was valid, but incomplete. Some of the shortcomings included:

- More emphasis on beddown and bare-base activities
- Doctrine should better prepare engineers for deployment to a location at which personnel, equipment and planes are in place and where priorities have been set
- Role of engineers in providing quality of life enhancements during wartime
- Lack of guidance for engineers involved in supporting a contingency, but stationed outside of the theater of operations
- Better delineation of the engineer's role in logistics support, particularly prepositioned assets.

In May 1994, representatives from the Air Staff, major commands, field operating agencies, and direct reporting units met at Langley AFB, Va., to update civil engineer doctrine. They produced a draft that, in an unprecedented move, the Air Force Doctrine Center approved after only one round of coordination. The new manual features several changes. In addition to the applicable material in AFM 3-2, the document addresses peacetime activities, environmental work, economic security, space operations, disaster preparedness, explosive ordnance disposal, Defense Planning Guidance, Gulf War lessons learned and the comprehensive Warfighting Review results. The outcome is a doctrine document that provides fundamental guidance and direction for the entire civil engineer mission of the mid-1990s.

A brief overview of some of the key concepts will highlight some of the information included in the document.

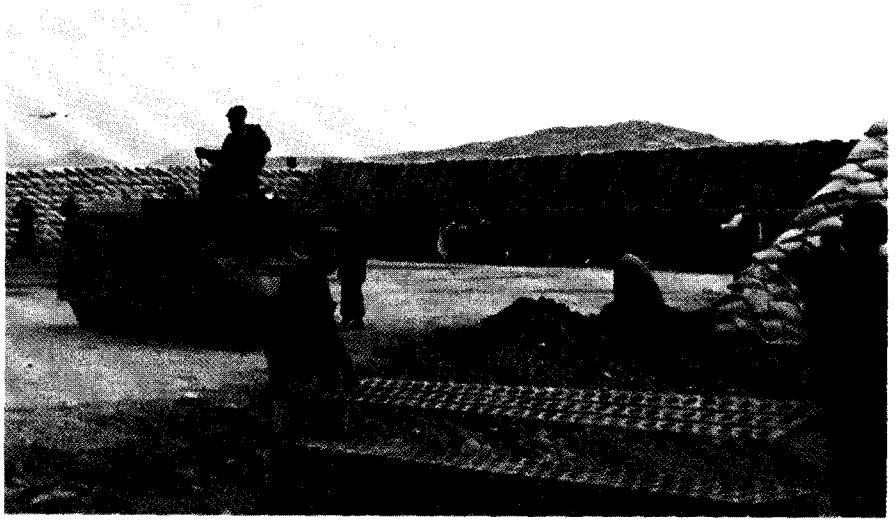
INTRODUCTION

The opening chapter describes how civil engineers relate to each of the five principles of Global Presence by providing, operating, maintaining, sustaining and recovering air bases. The base is a key component of the use of air power in all levels of war (strategic, operational and tactical) and military operations other than war (MOOTW). As demonstrated in the Gulf War, it is not enough to have a single base operational, a network of bases is required to project air and space power. Engineers play a pivotal role by ensuring the base is available when needed.

FUNCTIONS AND TASKS

Chapter Two details the various functions and tasks civil engineers perform in peace and war. They perform the broad peacetime functions of base development, housing services, operation and maintenance, environmental quality and emergency services using the latest technology. Contingency operations comprise deployment, base development, operation and maintenance, recovery and post-execution actions.

Engineers must be staffed, trained and equipped to fulfill their contingency mission because a real world deployment can hap-



Engineers in Korean War used host nation and contractor personnel.

pen at any time. In August 1990, Tactical Air Command engineering teams were at Hurlburt Field, Fla., competing to see who would represent the command in Readiness Challenge. One by one the teams pulled out of competition, returned home, and were on a plane heading for Southwest Asia in a matter of days or even hours. Even so, very few of the teams actually arrived on site before the deploying aircraft. The teams that deployed had to play "catch-up" for days and weeks.

Beddown, along with planning and defense, is one of the three elements of base development and is emphasized in the current document. The Air Force was able to deploy and beddown the necessary forces during Operation Desert Shield because we had the time. We may not be as fortunate in the future. In another place and time, engineers will find they need to plan and execute force beddown consistent with a number of limiting and conflicting factors without the luxury of a six-month buildup. Although time is often a critical factor in beddown, it is not the sole consideration. Threat, available resources, host-nation restrictions and the mission will all affect the engineers' work. Throughout all of this, they must use sound engineering principles, balancing the need for expedient design, construction, and maintenance techniques with the possible long-term use of the base.

A seldom discussed element of defense is base denial. This could include denying the use of friendly and enemy air base infrastructure and equipment to the enemy. The best example occurred in the days before the 1991 Gulf War cease-fire. A team of RED HORSE and EOD personnel denied the use of two enemy air bases in southern Iraq by destroying runways and taxiways.

Engineers must be prepared to recover bases. This damage may not always come from an enemy attack. In the past few years, bases have suffered greater damage from natural disasters such as the McConnell AFB tornado and Hurricanes Hugo and Andrew, than enemy attack. The close working relationship that has developed since disaster preparedness and EOD have joined civil engineering has improved our recovery capabilities.

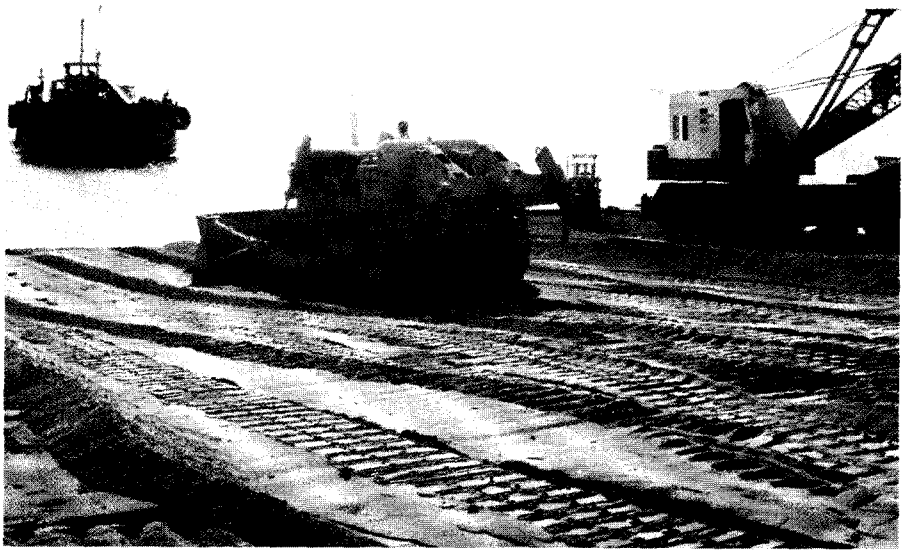
Civil engineers are playing an increasing role in the reconstitution of CE equipment and bare-base assets. This became critical during the weeks following the Gulf War as TEMPER Tents, generators and other equipment were shipped to Turkey for use in Operation Provide Comfort, but were not always in good condition. Also, when units returned home, many did not have the tools and equipment they needed had they been called upon to redeploy to a new location. Civil engineers must be prepared to not only assist in post-execution efforts, but also to operate and maintain sites where the reconstitution of assets and vehicles is occurring.

ORGANIZATION, COMMAND AND CONTROL

Organizational and command and control doctrinal guidance is some of the most important in the whole document and include an explanation of the differences between Prime BEEF and RED HORSE. The precepts include direction for engineers such as "organize in peacetime to be able to transition easily to contingency operations" and the recommendation that military engineers should be postured, first and foremost, within the force projection major commands.

During a contingency, when both Prime BEEF and RED HORSE engineers are deployed, the senior Air Force commander has command authority over these assets. Prime BEEF teams report to the senior Air Force representative on base. It is particularly important for operational control of RED HORSE units to remain within U.S. Air Force channels, because engineering requirements will exceed engineering

See ***Doctrine****, page 47*



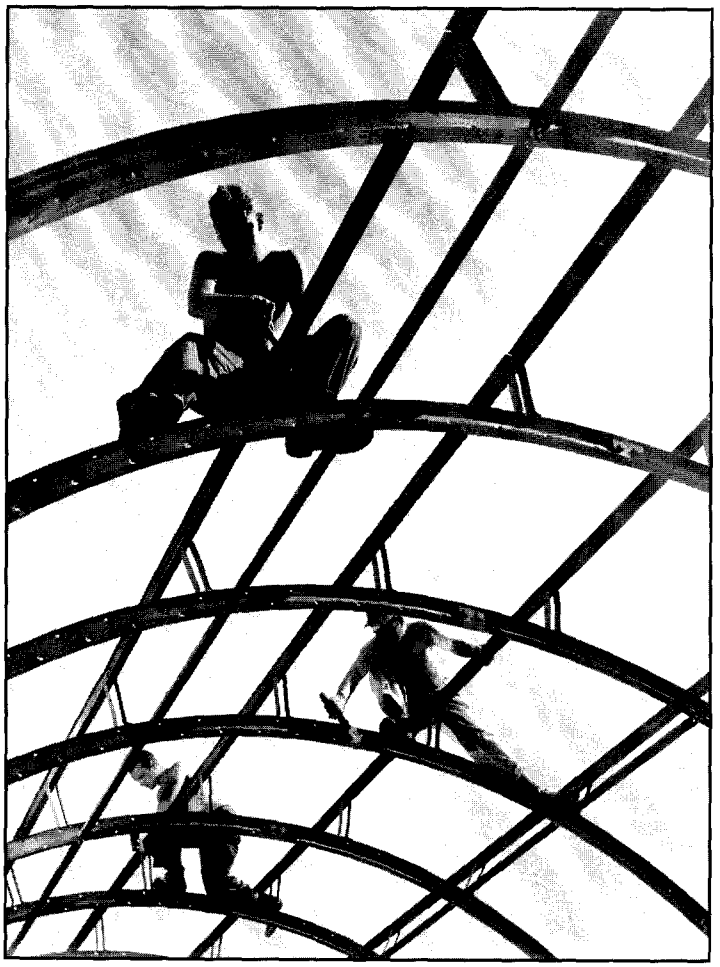
Engineers must arrive when and where needed. Construction equipment comes over the beach at Tuy Hoa AB, South Vietnam.

AVIATION ENGINEERS OVERCOME PACIFIC HARDSHIPS

by Dr. Ronald B. Hartzer
AFCESA Historian

This summer marks the 50th Anniversary of the end of World War II. Previous articles in this publication have highlighted the Aviation Engineers' vital role in the war. World War II was an important lesson for the Army Air Forces, one that unfortunately took 20 years to learn. The lesson was that air power requires the support of engineers who are specially trained, equipped and organized to fulfill that mission. The Aviation Engineers did that job as well as anyone. There is much to be learned from their experiences. In fact, much of our doctrine is derived from the insights of engineers during World War II. Many of the issues that confronted them more than 50 years ago are identical to the lessons relearned in Korea, Vietnam and Saudi Arabia. This article reviews the activities of the Aviation Engineers in the Pacific Theater. Engineers were deployed to locations extending from Hawaii to India and Australia to China.

Aviation Engineers saw action quite early during the war in the Pacific. The 804th Aviation Engineer Company came under fire on December 7, 1941 when the Japanese attacked Hickam Field, Hawaii. The 803d Aviation Engineer Battalion had endured a five-month journey to the Philippines in 1941, arriving just weeks before the Japanese attacked. The men repaired airfields, scraped out emergency runways and performed whatever engineering work was required. They soon found themselves serving as infantry troops, turning back a Japanese suicide attack at one



Top - Aviation Engineers place quonset hut ribs on another section of the air base in Marianas. (April 1944)
Left - A bulldozer, operated by an Aviation Engineer worker, clears a hard stand area for Boeing B-29 "Superfortresses" on Guam, Marianas Islands. (March 1944)

point. The Japanese captured two of the companies on Bataan, but Company A managed to reach Corregidor. There they worked to keep Kindley Field in operation, in the hope that additional aircraft would be coming. They never did. The remnants of company A were among the last Americans to surrender at Corregidor.

Facing an unexpected strategic situation in the theater, the engineers sought to strengthen the American presence in Hawaii and Australia. Before the war, Oahu possessed scarcely two bomber airfields. Within a year, the engineers had built 15 large bases, with revetments carved out of volcanic mountains, underground shops, miles of tunnels hewn in rock, tremendous aviation gas storage farms, and even a complete bomber runway nestled in a deep ravine for protection against enemy air action. In Australia, the engineers built seven dry weather fields near Darwin.

The challenge for Aviation Engineers in the Pacific were nearly insurmountable. Just building the bases in Hawaii and Australia to serve as springboards for any offensive action required special planning and logistical support to transport equipment and supplies thousands of miles. To carry the war to the Japanese required staggering logistical requirements. How were they to construct airfields in the heart of impenetrable jungles? How were hangars, shops and tank farms to be rapidly erected on a coral atoll where every stick of building lumber and every bar of steel had to cross 3,000 miles of water? How were pieces of heavy construction equipment to be off-loaded rapidly through pounding surf without harbors? How was water to be secured on a desert island where fresh water was nonexistent and attempts to dig wells were met by sea water at a depth of four feet? The engineers demonstrated their ingenuity by solving all of the above problems and many more just like them.

Return to the Philippines

After completing facilities in Australia, the engineers moved north to Port Moresby, New Guinea. The problems encountered were far worse than any planner had anticipated before the war. Because the requirements were so overwhelming and the engineering forces so limited and equipment scarce, all engineering resources were pooled under Brig. Gen. Hugh J. Casey, who had accompanied Gen. Douglas MacArthur from the Philippines. Thus Aviation Engineers, Army engineers, and sometimes even Seabees worked on whatever engineering projects had to be completed—runways, roads and harbors. Although Maj. Gen. George C. Kenney, commander, Allied Air Forces, complained bitterly, he could not persuade MacArthur to change his mind. The requirement for two engineering organizations and logistical supply channels seemed a waste of resources. Engineers were a precious commodity, prompting MacArthur to comment, "This is an engineer's war." The search for competent construction workers was demonstrated at one operational base undergoing expansion. General MacArthur asked the commander where he got all the carpenters who were busy erecting hangars, warehouses and camp buildings. The officer replied, "We gave each of the men a hammer and some nails. Anyone who hit his thumb more than once out of five times trying to drive a nail was eliminated. The rest became carpenters."

In preparation for MacArthur's return to the Philippines, Aviation Engineers constructed massive basing complexes at Port Moresby to serve as a springboard for the move toward Japan. Beginning in 1943, engineers led the way by carving airfields in the jungles of New Guinea at Milne Bay, Finschhafen,

*See **War**, Page 35*

Superfortresses of the new Tinian-based B-29 fleet striking Japan, sweep low over engineers working on the new base. (February 1945)

Battling the burning bush

by TSgt. Andra Higgs
editor
Photos by SrA. Michael Moriatis

Since staring into the reflective shine on a bright red fire truck as an 8-year-old, Marty Silva saw his answer to an ageless question asked of many young boys: he wanted to be a fireman.

Now a grown-up firefighter with the Vandenberg AFB, Calif., fire department, Silva's motivation to help people is akin to the glistening inspiration of his childhood vision.

Recalling that his first "live" call — assisting a stabbing victim, bathed in a pool of blood — was a squeamish sight far from the gleaming sparkle of that youthful moment, Silva said: "I was numb for several seconds, just standing there, staring, until someone bumped into me, and then, the training took over. It was time to do my job,"

Before completing the stabbing victim story, Silva and several other firefighters dashed off in an alarm-blarring instant to assist with the helicopter transport of a patient from the base hospital leaving half-filled coffee cups in their wake. The family-

type, kitchen-table morning chatter at the station was replaced with the stillness of a high-pitched humming from ceiling lights and air conditioners.

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The 120 prevention and protection specialists assigned to the 98,000-acre installation are typical of Air Force firefighters: professional, dedicated and well-trained. What's atypical, however, is the mission the department is tasked to maintain.

The base — situated in Santa Barbara County, about three hours north of Los Angeles — was formerly known, when under U.S. Army auspices, as Camp Cook, and later Cook AFB during the 1950s when the southern portion of the facility was operated by the U.S. Navy. A tinder box of wild artichokes, mustard and rye grass, the tundra on the base's outback can become explosively dry under the wilting rays of California sunshine. The rolling hills are anchored by dramatic drop-offs to boulder-laced, wave-smashing shorelines along 35 miles of "the great western fire break" - the Pacific Ocean. From a high point — Transquillion Peak at 1,700 feet — steep, Dwarf Oak chapparal-ladened canyons twist with Bishop Pines and "widow makers," Eucalyptus trees, which have earned the nickname because of a shallow root system and a track record of falling on firefighters during brush fires. The oily bark that constantly peels from this tree is just the kind of easily-combustible fuel that can turn a marshmallow roast into a raging, out-of-control brush fire.

This June 1993 detonation of a Minuteman missile that strayed off course 10 seconds after liftoff ignited a 1,500-acre brush fire on the base.

The base has several major structural apparatuses which are high on the fire protection platform, including sensitive listening stations, radars and a combined nine Air Force, NASA and commercial-venture space and missile launch pads. Despite only having a squadron of five helicopters assigned, the 13,000-foot runway — originally constructed to accommodate now-cancelled plans to land and launch the space shuttle — remains busy with transient aircraft performing routine touch-and-gos.

"I've sure had my share of a variety of calls," said A1C Gabriel Maggini. He has one and half years under his firefighting belt and also is a certified emergency medical technician. "Vehicle accidents, medical aid, putting out fires; this variety is what makes it interesting and fun."

But fighting fires at Vandenberg hasn't always been fun.

"With all the rain we've had this winter, we see a worsening potential for fire this year once all the foliage dries out this summer," said MSgt. Allen Zehms, assistant chief of operations. "We expect the worst and we train for it."

Hot Shots work dangerously close to wildfires.

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The worst, to date, came Dec. 20, 1977.

Prior to a scheduled Blue Scout missile launch, an on-scene command post was established. Gusting 90 mph, Santa Ana winds downed a power line. In the midst of a 50-year drought, the dry Manzanita shrubs and oak chaparral ignited, fueling the canyons into a firestorm.

Within minutes, the base fire alert system summoned support from county, state and federal agencies.

Positioned on an adjoining ridge to assess the situation, the base commander, fire chief and assistant fire chief took notice from a vehicle as fire approached the space complexes and buildings housing nearly 3 million pounds of solid rocket fuel and toxic chemicals. Nearby, a bulldozer operator attempted to widen a fire break.

Without notice, wind gusts increased to more than 100 mph, shifting fire across the canyon to the ridge where the command trio was located. A final radio call was acknowledged by the chief before flames exploded over them. Their bodies were recovered 170 yards from their vehicle. The bulldozer operator appeared to have attempted to use the scoop for protection. Badly burned, he succumbed to injuries a month later. Ironically, the only damaged sustained to the vehicle the commander and fire chiefs abandoned was bubbling to the exterior paint on the driver's side rear quarter panel. A vehicle from the Santa Barbara County Fire Department that was on the same ridge also sustained similar, minimal damage. Its occupants, who remained in their vehicle as the flames passed over, survived unharmed.

"That was a dark day," said Battalion Chief Michael Marko, recalling the fire that claimed the life of one of his closest friends and injured 68 others. "No one said much, because we still had to put the fire out, but we all knew what happened, and it affected us greatly. It was one of the fastest moving fires I've seen. It burned the tops of plants and trees in one direction, the wind would shift, and it came back and burned the bottom portions."

The true significance of the three-day, 1,000-person effort to douse the 20,000-acre fire in the Honda Canyon section on the southern portion of the base was not that damage to buildings or launch facilities were minimal, but that efforts to develop a comprehensive plan to strategically fight wildland fires were set in motion.

A Hot Shot hauls a hose during the 1993 Los Angeles/Altadena fire.

Travel to work for Hot Shots is often done on foot.

According to Marko, a communications network to encompass all fire fighting resources — military, local, state and federal — was established. Also, all-terrain, four-wheel drive type brush trucks designed to fight wildland fires were acquired, and heavy equipment used during night fire-fighting operations were equipped with headlights. Firefighters were reoutfitted in lighter clothing, more suited for fighting brush fires. Also, Vandenberg firefighters began receiving at least 32 hours of formal classroom instruction in basic wildland fire suppression techniques as part of their 5-level skill training.

"It (the fire) opened a lot of eyes," said Marko. "Instead of jumping out into a fire, the strategy now is to look at things from a fallback position to determine where we can safely go in and create a buffer to put the thing out. It's unfortunate that it took a tragedy to make us realize that we needed to do something different when fighting fires."

The following year, in 1978, the special training which was implemented became

the precursor to today's Hot Shots - specialized "hand crews" dedicated to the mission of fighting wildland fires. Much of the work current Hot Shots crews accomplish follows the 1980 recommendations made by a University of California panel commissioned by Vandenberg officials to develop a strategy that would reduce available fuels for brush fires through controlled burns. Out of the Wildlands Fuels Management Plan, the Hot Shots were formed in 1981 as seasonal overhires — May to December — to implement the recommendations.

Hot Shots, crews that specialize in ground attacks on fires, are part of a proud heritage of forest firefighters. Smokejumpers have been parachuting onto forest fires for 56 years; and the helicopter-based Helitack crews also perform work in heavily-wooded areas.

According to TSgt. Mark Smith, superintendent of Vandenberg's Wildland Fire Fighting Academy — where Hot Shots receive 110 hours of training on safety, facilities review, weather and topography — cutting fire breaks is principle to the Hot Shots work. To do this, the 20-person "hand crews" use chain saws to clear the tops of shrubs, grasses and small trees, axes with grabbing ends to snatch up the plant roots and, finally, an oversized hoe with a rake on one end to grind up the shrubbery.

Most Hot Shots have worked as volunteers with civilian fire departments during the five non-fire season months. Most are looking for training and experience to later gain full-time employment with other departments, Smith said, noting that the Hot Shots are subject to fire fighting assignments throughout the state - from San Diego in the south, to Yosemite in the north - depending upon requests. Most of this year's 20 wildland firefighters are returnees from previous fire seasons, including one 10-year veteran.

There are, however, first-timers.

"It brings tears to my eyes to see these guys take their training and become effective firefighters," said Assistant Fire Chief Phillip Rennie. "The training is geared toward managing any fear that might prevent them from doing their jobs. Some people are afraid of computers but, eventually, they get over it. The same is true with fire."

When a 20-person team is on an installation the size of Vandenberg, third largest in the Air Force inventory (to Eglin and Edwards AFBs, Fla. and Calif., respectively), fighting fires is a team building experience, with safety always the primary concern.

Lessons learned have been critical for training units such as the Hot Shots which can be airlifted or strategically placed in fire areas that are inaccessible to heavy equipment, helicopters or aircraft, depending upon weather, fuel or topographic conditions. Additional tactical assessments of wildland fire-fighting techniques were prompted following the July 6, 1994 deaths of 14 Hot Shots who were lost on Storm King Mountain in Colorado.

Building firebreaks to contain fires is a team effort for Hot Shots.

There, a small three-acre Fourth of July fire became a 1,900-acre firestorm that began encircling 50 firefighters during what the National Weather Service calls a "red flag" condition — high winds, low humidity coupled with drought and dry trees and brush — which, that day, was fanned by 35 mph winds. For the firefighters pulling up the rear, thickening walls of smoke equated to an instinctive hike out of the canyon to safety. As the fast-moving fire overtook the group working the south-facing slopes, they deployed their "Shake and Bakes" — small aluminum tents bonded to fiberglass that reflect radiant heat and provide a small amount of breathable air — and survived.

For the group of 16 Hot Shots — 11 men and five women, nine of whom were from Princeville, Oregon — on the north slope, the dry Gamble oak brush exploded up the 150-foot ridge at a speed estimated by federal investigators near 18 mph. The 55-degree slope was so steep that it could be touched standing straight up. One investigator said flames moved so fast up the ravine's slopes that not even Carl Lewis could have outrun them.

Fourteen bodies were recovered at various locations on the slope, some beneath melted "Shake and Bakes" which lead investigators to believe that the firestorm yielded temperatures as high as 1,600 degrees. Two men did, however, in a dash for their lives, clear the ridge just as the reported 50-foot tall flames jumped the slopes' crest.

An Occupational Safety and Health Administration report cited federal land managers for "plain indifference" for failing to communicate weather conditions to firefighters, while a U.S. Forest Service and Bureau of Land Management report noted a "can do" attitude of firefighters as a contributing factor in the tragedy.

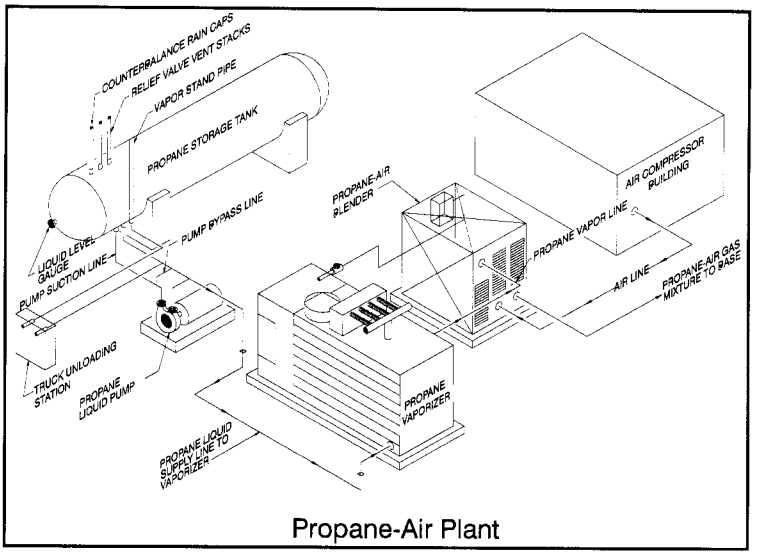
"We preach the safety factor, with one of our teams' goals being not to put someone in an unsafe environment. We're not going to do something stupid," said Zehms. "We want it to be foremost in their minds at all times, especially during

*See **Vandenberg**, Page 38*

Propane systems offer alternatives

Propane-Air Systems offer an alternation to underground storage tanks and a solution to high natural gas costs. Air Force bases are evaluating the installation of propane-air mixing plants as a back-up for natural gas. This allows the base to replace oil as the backup fuel and remove those old, deteriorated and possibly leaking underground storage tanks. However, cost savings is the real attraction to these systems.

A propane-air system allows an installation to switch from higher firm service gas rates to lower cost interruptible rates. The propane plant is an insurance policy that is brought on-line during those few days when your natural gas supplies are interrupted. These systems have been acquired through the Energy Conservation Investment Program and Energy Savings Performance Contracts.



Propane-Air Plant

Figure 1.

Propane-Air Mixing Plants

Most natural gas utilities offer both firm and interruptible gas service. Firm service is purchased for requirements such as base housing which do not have backup fuel. Interruptible service is usually purchased for a heat plant where fuel oil is available for periods of gas interruptions. Generally, the firm price per decatherm or Mcf used is considerably higher and may include a demand charge. Through the use of interruptible gas an installation may realize savings in both the cost of gas and the demand charge. However there must be alternative fuel available to prevent freeze damage and for operations to continue during interruption of gas deliveries. A propane storage plant can be used as an alternative fuel to convert either part or all of a load to interruptible service when there is no fuel oil backup. Due to the structure of natural gas pricing and higher cost associated with larger propane-air facilities, it may be economically advantageous to maintain some firm natural gas supply and convert only part of the load to the interruptible rate schedule. In this case, propane is used for the load peak that exceeds the firm gas availability when interruptible gas is not available, hence the term "peak shaving." Interruptible gas is normally used whenever available because it is less expensive than propane.

Code Requirements

When considering the installation of a propane-air plant, space requirements are important. National Fire Protection Association 58 and Occupational Safety and Health Administration are the basic codes that are generally followed.

Storage tanks of more than 2,000 gallons must be located 50 feet from buildings or property lines. Vaporizers must be placed 10 feet from unloading facilities, 15 feet from tanks and 25 feet from buildings. These distances may be modified by local governing authorities. Some insurance companies require up to 75 feet between tanks, vaporizers and unloading facilities. (See Figure 1.)

Additional fire protection may also be required, particularly in built-up areas. These may take the form of insulation, deluge water systems or of putting the storage tanks underground. The appropriate Air Force guidance for storage of propane should be reviewed for the particular requirements.

Environmental and Safety Considerations

Environmental permitting is not generally required for a propane-air mixing plant. The storage tanks do not generally require permitting or registration. There are no Environmental Protection Agency requirements for leak detection or monitoring systems. The vapor pressure of propane is such that any propane that is released to the atmosphere will vaporize immediately. Propane is heavier than air and precautions should be taken to ensure that the propane-air plant is not located in a depression or surrounded by dikes or beams. Propane is not an ozone depleting substance. State and local permitting requirements should be investigated prior to proceeding with a project.

The propane air plant will generate noise while in operation. Air compressors are the principal source of the noise. Special consideration should be given to noise and noise reduction in siting, designing and constructing a plant.

Propane-Air Mixture Characteristics

When vaporized and properly mixed with air, propane gas can be used in existing systems fired with natural gas. Air must be mixed with the propane because the density and heating value of propane are much higher than that of methane, the primary component of natural gas.

The approximate ratio of dilution of the propane required is 45.1% air and 54.9% propane. The resulting mixture has a specific gravity of about 1.287 and a BTU value of approximately 1400 BTU/CF, which is compatible with natural gas-fired equipment.

Propane-air cannot be used to fuel natural-gas vehicles. The Wobbe Index is the best indicator of the interchangeability of a specific natural gas and propane-air mixture. The Wobbe Index is a number indicating the interchageability of fuel gases. It is obtained by dividing the heating value of the gas by the square root of its specific gravity. If the natural gas and propane-air mixture have an identical Wobbe Index, they will produce an

equivalent amount of heat and combustion products and will require the same amount of combustion air. Burners provided with a replacement of a lower Wobbe Index will experience minor combustion changes. Substitution of a gas for one with a higher Wobbe Index generally allows a narrow acceptance range. Flame characteristics determine the acceptance range for a propane-air mixture.

Propane-Air Mixing Process

There are five separate steps in the propane-air mixing plant process.

The steps are:
Liquid propane gas unloading;
Storage of liquid propane gas;
Liquid transmission from storage to the vaporizer;
Propane vaporization;
Propane-air mixing process.

Design for LP-gas plants is basically the same, regardless of ultimate use, and certain items of equipment are required in all cases. Major equipment items include the storage system, unloading facilities, propane pumps, vaporizer, and mixing equipment.

For proper selection of equipment the following information is required:
Maximum hourly demand;
Heating value;

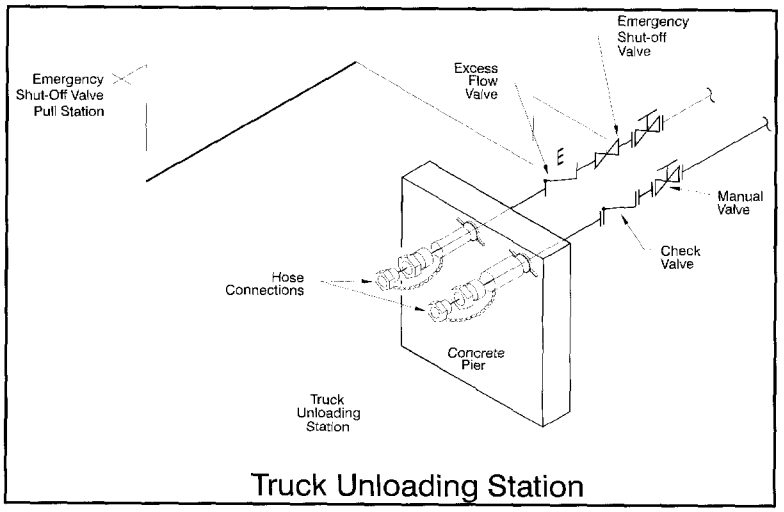


Figure 2.

System pressures;
Space requirements
Availability of railroad siding or trucking facilities for the transport of the propane to the site.

Unloading Facilities

Provisions for propane deliveries to the site must be made when designing a propane-air plant. Only two methods of delivery are available, by truck or by rail. If a rail line is in place and readily accessible, its use should be considered, especially for larger plants. However, most propane-air plants rely on truck transports for delivery of propane. Accessibility, roadway support, and safety considerations must be taken into account when designing the unloading facility.

The unloading parking apron for a transport truck must be completely level to allow for maximum propane transfer. If the unloading parking apron is not level it will limit the amount of fuel that can be off loaded from the transport truck. Truck delivery of propane can be accomplished using bobtail or transport truck. The bobtail truck is the normal delivery method to small customers, particularly residential customers. Bobtail trucks range in size from 2,000 to 3,500 gallons of capacity. It is the most costly method of propane delivery. If the unloading apron is not level, delivery will only be possible by bobtail truck. Transport trucks typically range in capacity from 9,000 to 11,600 gallons and either unload from the center or rear end of the trailer.

The propane truck is equipped with a liquid pump. The liquid pump is used to push the liquified propane gas from the truck's tank to the propane-air plant's storage tanks. The transfer of the propane is accomplished by connecting two hoses to the unloading station (See Figure 2). One hose is attached to the vapor line connection, which is piped to the vapor connection of the storage tanks. The second hose is attached to the liquid line connection, which is piped to the liquid connection of the storage tanks. The liquid is located on the propane truck. After the hoses have been connected to the unloading station,the LPG is pumped into the storage tanks, and the vapor in the storage tank is evacuated into the truck's tank. When all of the liquid is removed from the truck's tank the unloading process is completed. The vapor remaining in the truck's tank cannot be recovered using a liquid pump.

Delivery of propane by rail requires a railroad unloading tower and a rail car unloading compressor. The method of unloading a rail car is different than the method for unloading a truck. The propane plant must have a railroad unloading tower and a rail car unloading compressor. Unlike trucks, rail cars are not equipped with pumps or compressors for unloading. The suction end of the compressor is piped to the vapor connection of the storage tanks. The rail car vapor hose is connected to the discharge of the compressor. The unloading of the rail cars is accomplished by the compressor drawing vapor from the storage tanks, compressing the vapor to a higher pressure and sending the compressed vapor to the rail car. The compressed vapor displaces the liquid in the rail car tank. The liquid in the rail car tank is forced into the liquid hose and into the storage tanks. When all of the liquid has been removed from the rail car tank, the compressor is reversed so that the suction end of the compressor is connected to the rail car and the discharge is connected to the unloading stations' liquid line connection. The rail car's liquid outlet valve is then closed, and the compressor is used to transfer the vapor from the rail car to the storage tanks. The vapor is sent through the liquid inlet of the storage tanks causing the vapor to condense as it enters the tank. The majority of the vapor in the rail car can be removed.

Storage System

Propane is stored under pressure in liquid form. The size of the pressure vessels vary from the small cylinders used on fork lift trucks, up to 90,000 gallon storage tanks. The storage tanks must be manufactured in compliance with the applicable codes of the American Society of Mechanical Engineers (ASME). The tanks will have an ASME stamp if they are manufactured in accordance with the codes. The usual size range for commercial standby plants is from 1,000 gallons up to 30,000 gallons. The latter size is the most

*See **Propane**, Page 48*

Shaw civil engineers named best in Air Force

by Capt Mike Caldwell and MSgt. Tina Sims
20th FW/Public Affairs

Quality programs and base and community support are the reasons 20th Civil Engineer Squadron Commander Lt. Col. Joe DiRosario gave for his unit being named the Curtin Award winner for 1994, signifying the best civil engineer squadron in the Air Force large unit catagory.

"It was a total team effort from across the base and we received tremendous support from the Sumter (S.C.) community as well," said DiRosario. "The evaluators were impressed with the people who came out to support what we do, especially the political and business leaders in Sumter."

The commander said the highlight for 1994 was a Common Sense Improvement Plan initiated in the squadron which has resulted in the highest customer satisfaction rating in Air Combat Command.

"It's a quality program we designed and everybody understands," he said. "Everyone with the squadron is involved to identify and implement quality improvements."

The 20th CES was presented the Curtin Award trophy at a recently held reception ceremony.

Members of the 20th CES who traveled to Bolling AFB, Washington D.C. to collect the prestigious Curtin Award at the 33rd Annual Civil Engineer Award luncheon, also snagged the Air Force Outstanding Civil Engineer Environmental Flight Award for 1994.

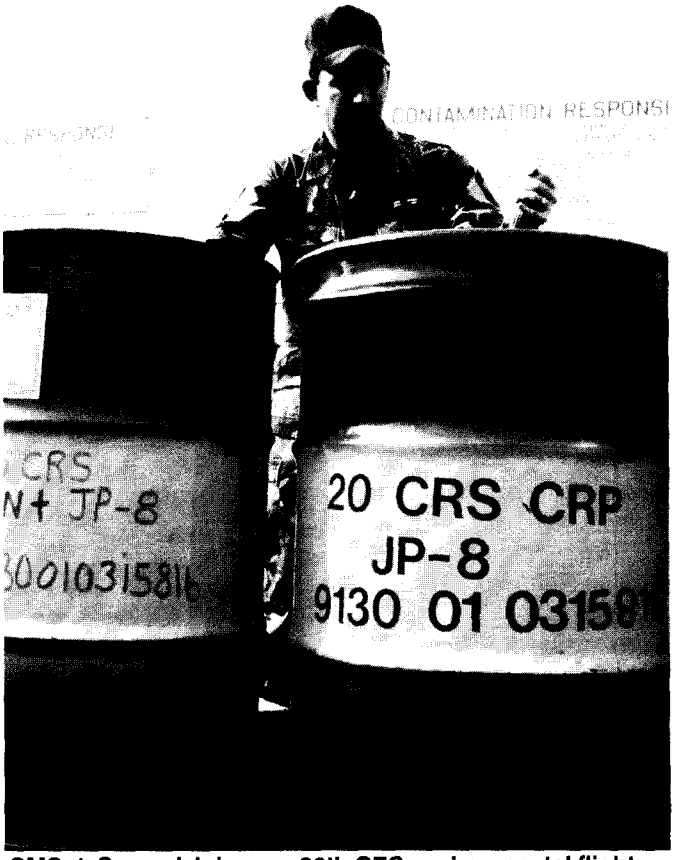
"We've been innovative and proactive in our management philosophy," said Marshall Dixon, environmental flight chief. "Our hazardous waste, compliance, pollution prevention and installation restoration programs have all made significant contributions."

The installation restoration program was selected as a test base for new Air Force initiatives, including receiving a Total Environmental Restoration Contract from the Defense Department, he said.

Other accomplishments of the environmental flight include publishing the Environmental Crossfeed, a monthly newsletter committed to base compliance and informing squadrons personnel about important environmental issues. There's also an active Environmental Compliance and Assessment Management Program; reorganization of the natural and cultural resources program to a total ecosystem management approach and initiation of a full-accumulation point recycling center in ACC.

According to Randy Adams, projects and programs manager, the award for the environmental flight is an award for all Shaw members.

"Our jobs couldn't have been done without the cross-functional cooperation found among the units on base," Adams said. "Adding to this team concept, we have received outstanding leadership and empowerment from ACC all the way down to individuals performing tasks."



SMSgt. Samuel Johnson, 20th CES environmental flight quality assurance manager samples for waste analysis.

By working hand-in-hand with base units and vigorously managing the ECAMP program, 86 percent of the base's findings were closed out between the May 1993 internal and the May 1994 external ECAMPs — 66 percent in the first five months.

"One of our major accomplishments for 1994 was implementing Quality initiatives. We learned what a difference it makes in customer service," Adams said, "to begin an initiative from a Quality team approach to closing out and preventing ECAMP findings. By working with the shops in the field, we can prevent findings," he said. "It's a new approach in its early stages, but we think it's going to work. We will have individual accountability and get feedback from our customers.

"We don't want the people in the shops to look at us as regulators, but as coworkers with the same mission — abiding by ACC and environmental requirements and regulations," Adams said.

In addition to the panel that judged the competition and those in the Sumter community, at least one other person heaped praise upon the award winning 20th CES.

"We always knew they were an outstanding squadron," said Congressman John Spratt, U.S. representative, 5th District, S.C. "Now we know they're the number one engineering squadron in the country. They help to make Shaw the outstanding base that it is, and they have my warmest congratulations."

On hand to personally congratulate the squadron members during the awards ceremony, Spratt also saw the unit win the Col. Frederick J. Riemer Award for flight readiness.

"When you look at their record of accomplishments and how they've helped the Sumter community, there's no question why they won." CE

Columbus wins small unit award

The 14th Civil Engineer Squadron, Columbus AFB, Miss., is the recipient of the 1994 Curtin Award for being the Air Force's outstanding CE squadron, small unit category.

"This award recognizes everyone from the wrench turner to the paper pusher," said Lt. Col. Ralph Rhye, 14th CES commander. "Our focus during the evaluation was to show the team how we take care of our customers, and some of the ways we use Quality Air Force principles to continuously improve what we do on Columbus. It's an honor winning the award, but our bottom line remains day-to-day improvements in customer service."

The individual flights which make up the 14th CES combined their efforts to garner the award. Maintaining a high level of readiness, the unit deployed 14.5 percent of its people 90 days or more. "We were one of the most supportive bases in the command," Rhye said. "That support came from the folks who volunteered for some tough temporary duty assignments."

Extensive training and inclusive checklists helped the fire protection flight prove it had the best hazardous materials capability in the command during a 1993 Air Education and Training Command visit.

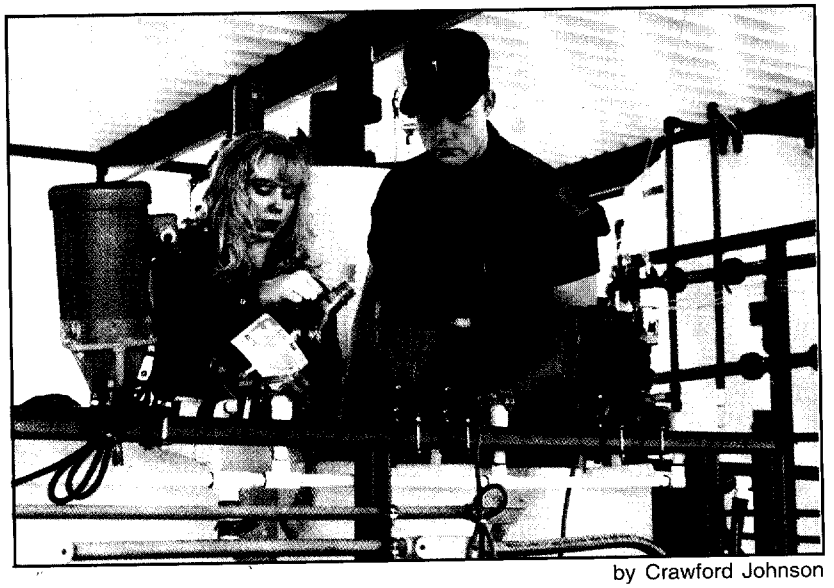
The housing office showed unparalleled housing management, reducing vacancy by 2.8 percent and slashing customer complaints by 80 percent.

Engineering had 98 percent or better design/contract award metrics, 92 projects designed totaling $10 million, and a minuscule contract cost growth of 100.03 percent. "With the fantastic support of the 14th Contracting Squadron, our young engineering staff pulled off one of the biggest coups of all time with a record-breaking $8.7 million construction program."

The operations flight completed 100 percent of it emergencies and 81 percent of its urgent job orders within two days. They also had unsurpassed quality indicators, missing only one commitment in 15,647 job orders through August, Rhye said.

"I can tell you, if we had one weak link in the squadron, we wouldn't have won the award," he said. "My hat is off to all 290 members in the squadron spread across our seven flights. The award belongs to them."

In November, Rhye, was notified the squadron had won an unprecedented seven of 34 AETC awards, including the 1994 outstanding CE unit award. The squadron was also recognized for its environmental, natural/cultural resources, and resource management programs. ***(Courtesy, 14th FTW Public Affairs)*** CE



by Crawford Johnson

Robyn Gaston and 2nd Lt. Dayton Nooner, 14th Civil Engineer Squadron, perform tests on a sludge treatment system.

"Caveman" methods used in Fuertes Caminos

by TSgt. Phil Berube
14th Flying Training Wing

Members of the 14th Civil Engineer Squadron returned to Columbus AFB, Miss., recently after a month-long stay in El Salvador.

The squadron was the Air Force component of the Joint Task Force exercise Fuertes Caminos '95 El Salvador, whose continuing mission is to help build that country's infrastructure.

Thirty-six 14th CES members workers joined teams from the Army, Navy and the Salvadoran military. The task force's objective is to complete 10 schools, two bridges and 15 wells before summer.

"The task force is now ahead of schedule," said Maj. Mitch McGee, 14th CES chief of operations and flight leader. "They should get done with everything soon."

Despite what McGee described as "caveman construction" techniques, the Columbus team was able to finish one school and nearly completed another. "We had to mix our own cement and pour it into molds using wheelbarrows. Here, the cement would have been delivered by a cement company. The techniques involved [there] are very primitive. We substituted hard work for modern equipment," he said.

According to McGee, the task force is ahead of schedule, and as such, the last Air Force Team taking part in the exercise, Dyess AFB, Texas, was able to cut the amount of people being deployed by one-third.

"It feels good to be back home. This was a definite learning experience," said SrA. Chris Ford, electrical systems apprentice. "I'm an electrician by trade, and I was able to learn a lot about construction while down there."

"I learned if I go down there again to bring my own air conditioner!" McGee said. Temperatures reached 118 degrees, and despite it being the "dry" season, they had to battle wind and rain storms. One storm, he said, pulled three tents out of the ground. The team was also responsible for maintaining a tent city.

"Everyone from Columbus did a great job. We had comments from Army construction workers saying we were the best Air Force team they've seen," McGee said. "The morale was good despite having to work hard, hot 14-hour days." CE

Let the Games Begin!

by TSgt. Andra Higgs
editor

The two-month journey along a road to victory at Readiness Challenge V for the U.S. Air Force Academy team had pit stops for more than just fuel. Breaks for training in New Mexico, Nevada and Arizona at Holloman, Nellis and Davis-Monthan AFBs, respectively, were part of the team's preparation for the worldwide competition held at Tyndall AFB, Fla., in April.

According to TSgt. Jerry Lewis, leadership on the Academy team was a cornerstone in molding younger troops, quickening the gel toward an overall team title.

"We weren't just stopping to use the bathroom or to get something to eat," said Lewis, whose next duty assignment is as a cadre member with the 823d RED HORSE Squadron, Detachment 1 at Tyndall's Silver Flag Exercise Site, the new home of the competition. "Every time we stopped on the road to all the training sites, everyone got out of all the vehicles and changed cars before we pressed on. That way, we all got to know each other a little better."

Which may be a distinguishing point between the winner and the finishers at the 1995 Civil Engineer and Services Worldwide Competition.

For the Academy team, lessons learned from a sixth place finish at Readiness Challenge IV prompted a reevaluation of the teams' approach toward their mobility mission and an assessment on how the team could compete more intensely; which may be a distinguishing point between the winners and the finishers at this year's competition. Whatever changes were made paid off. Of the 26 civil engineer and services team and individual awards handed out at the awards banquet, the Academy team or individuals garnered 16 — 10 first, three second and three third place finishes.

"Every team had a plan. Every team attempted to execute it. Every team finished. One team won but there were no losers," said Lewis, a leader on the Academy team and one of the Air Force's 12 outstanding airmen in 1993. "The likelihood in today's environment that some or all of these units could work as one in a real-world environment is high. So, it's imperative that we train and understand how to do things together."

The 13 teams, from each major command; 11th Support Wing,

Bolling AFB, Washington, D.C.; the Academy; the Air National Guard; Air Force Reserve; and 4 Wing, Cold Lake, Alberta, Canada, performed against the clock and in most instances under the scope of senior career-field staffers and other competitors.

"Some teams just couldn't handle the pressure," said SSgt. Rick Felix, a multiple event performer with the 11th. "It wasn't just with one team, look at any squad. You'll find troops who've never been to a competition, never been on a deployment, who simply crumbled when the pressure was on. No matter how many times an operation is practiced on your home station things happen."

And they did.

The roof framing caved in on a nearly completed tent structure. Some teams, in a push to beat the clock, logged procedural oversights on critical items during event operations. Safety violations. Make no mistake, however, this was no slapstick road show. Examples of the team concept kicking in to compensate for individual miscues were abundant.

"Our objective when we came here was to perform better than we had during the previous competition," said MSgt. Eric Brooks, disaster preparedness specialist on the Academy team. "We didn't want any of our people to come here and feel pressure about giving their best effort. Winning wasn't the only objective. Doing so, that's great. Being a contributing team member, giving 150 percent on every effort was even greater. That was what happened for our team."

It happened for other teams, as well.

"It's a pleasure working with such professionals," said SSgt. James Mitchell, 437th Services Squadron, Charleston AFB, S.C. The 437th was the Air Mobility Command competition entrant. A participant in three events, Mitchell said that RC-V provided a good idea about mission goals and expectations in a deployed environment.

"We came here together as a team. It wasn't just services or civil engineers. We combined our efforts and everybody forgot about everything else. Our perspective was that no matter where we finished, first or last, we weren't complete with an operation until the last person on our team crossed the finish line. This was an awesome experience, and the bottom line was that we had fun in the process."

That process involved competition coordinators selecting 21 out of a possible 51 events for which teams and individuals would be judged on skills that civil engineers and services personnel are expected to perform during a real-world contingency. For most teams, this meant organizing training schedules 60 days prior to the competition which included weight lifting, running and living under field conditions.

"My body is aching so bad, I can hardly stand it," said Brooks, dragging his feet in the sand outside the competition site tent-city field exchange. Midway through RC V and questioning his physical capacity to press on, the 35-year-old claimed an early arrival of a geriatric condition, "This is a young man's competition. I'm too old for this."

The competition — a labyrinth of teams marching or being bused along dusty, pine-tree laced roads to and from events on the 1,000-acre training site — combined long hours, hot weather, wind, rain, thunder and lightning during one week of events which ranged from hardback tent construction to lighting mobile kitchen burners.

"It's a pleasure working with such professionals."

"Now that engineering and services' strong union is apparent, it's important that we continue working as a team," said TSgt. Tommy Mulholland, a cadre member who supervised the fire search and rescue event. "The only way any of us succeeds is that we communicate as a team. When the senior leaders give us the opportunity to work in an environment such as this, it's important that we develop the expertise of our people to the fullest extent possible. Many of the teams [at Readiness Challenge V] won't have every piece of equipment at their bases to conduct the home station training that will make them proficient in a field environment. Even though it's only a week, Readiness Challenge does that."

"Seeing the wartime tasking at work is an opportunity for services and engineer personnel to get away from home station role of filling work orders," said Col. Steven Kukuk, 437th Civil Engineer Squadron commander. "This really gives people the right perspective of the Prime RIBS and Prime BEEF training which is the real reason we're here."

The perspective for some competitors was likened to a roller coaster ride as home station training on events which yielded much promise fizzled to disappointment at RC-V.

"What we discovered is that we can do an operation 12 times at home with no one watching, get to the competition and one thing goes wrong and matters start to unravel," said Capt. "Jeep" J.P. Wedding III, Nellis AFB, Nev., and a member of the Air Combat Command team. "I think the Fog of War is the truest indication of a real-world scenario. Some of the other events are just very much for show. I think a good overall reflection of what people are capable of doing would be to have a no-notice tasking where we show up at a point and time with all the gear we have based on annual reports. The way it stands now, we get to Readiness Challenge and are worried more about pressures to perform instead of concentrating on processes."

The Fog of War was one of 21 events during the competition. The multiple-site event offered logistical challenges for teams to overcome within specified time limits while setting up a bare base operation capable of landing a helicopter, generating electrical power, establishing a billeting tent, a field laundry unit and erecting a mobile kitchen. The realism for teams ranged from having personnel not familiar with some equipment to a counterbalancing variable for all being that no team had advance notice of the conditions under which the scenario would be played out.

"The Fog of War gives the feel of a real-world experience that shows what a unit will need to accomplish once they get to a deployed location," said Brig. Gen Eugene A. Lupia, then The Air Mobility Command Civil Engineer. "This allows the units to get a feel for who they'll report to in the field and the challenge of having to figure out exactly what and how they are going to do it."

The development of skills to enhance deployment tasking is a primary concern for current and future career-field leaders.

"In the long run, this experience will provide the Air Force with a better, more well-rounded airman who has developed skills and may one day provide a commander with multiple assets if they're ever in a forward-deployed environment," said Wedding, a

RC-V: Skill, sweat and a whole lot of spirit

design engineer. "Everyone comes away with more respect for someone else's abilities than when we arrived."

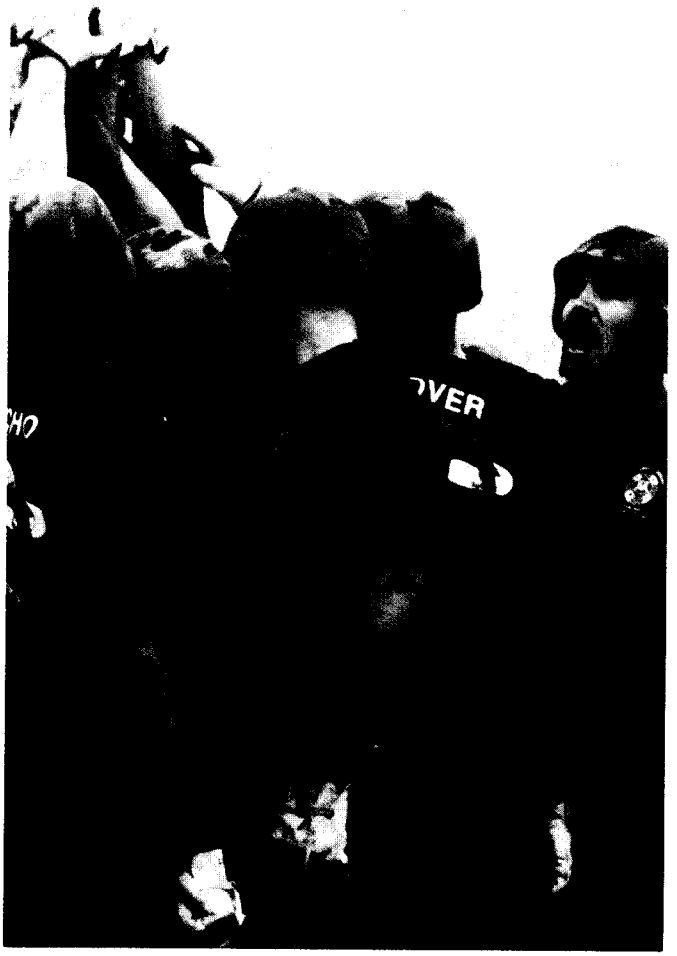
First-time observer Maj. Keith Yaktus, chief of CE operations, Reese AFB, Texas, was impressed with the exhibition of skills by RC-V competitors.

"The fliers have their Top Gun, so it's great to have something like this. We get to see wartime capabilities," said Yaktus, who is scheduled to become the commander of 823d RED HORSE Squadron, Detachment 1. "At a normal base, we sometimes get caught up in making sure the grass is cut and sidewalks edged more than our wartime skills. The events I saw were realistic and the perspective of seeing the competitors accomplish the tasking while keeping the mission in mind at all times was superb."

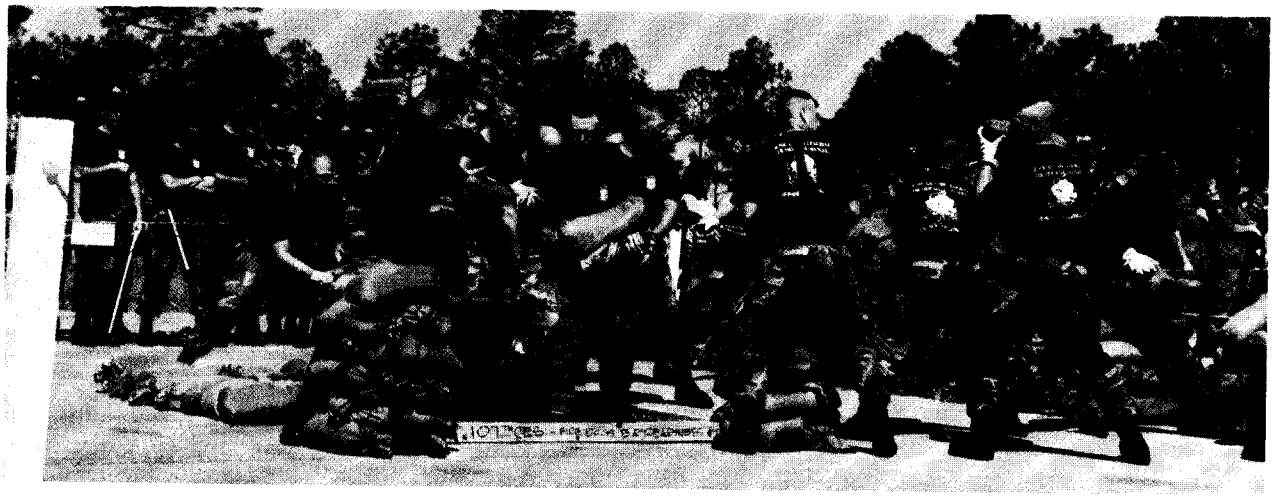
One new twist to this year's competition was the involvement of Public Affairs (PA) personnel in the competition. As in the past, they supported the media coverage of the event and published a daily newspaper. However, they went further by actually competing in the Fog of War event with their respective team.

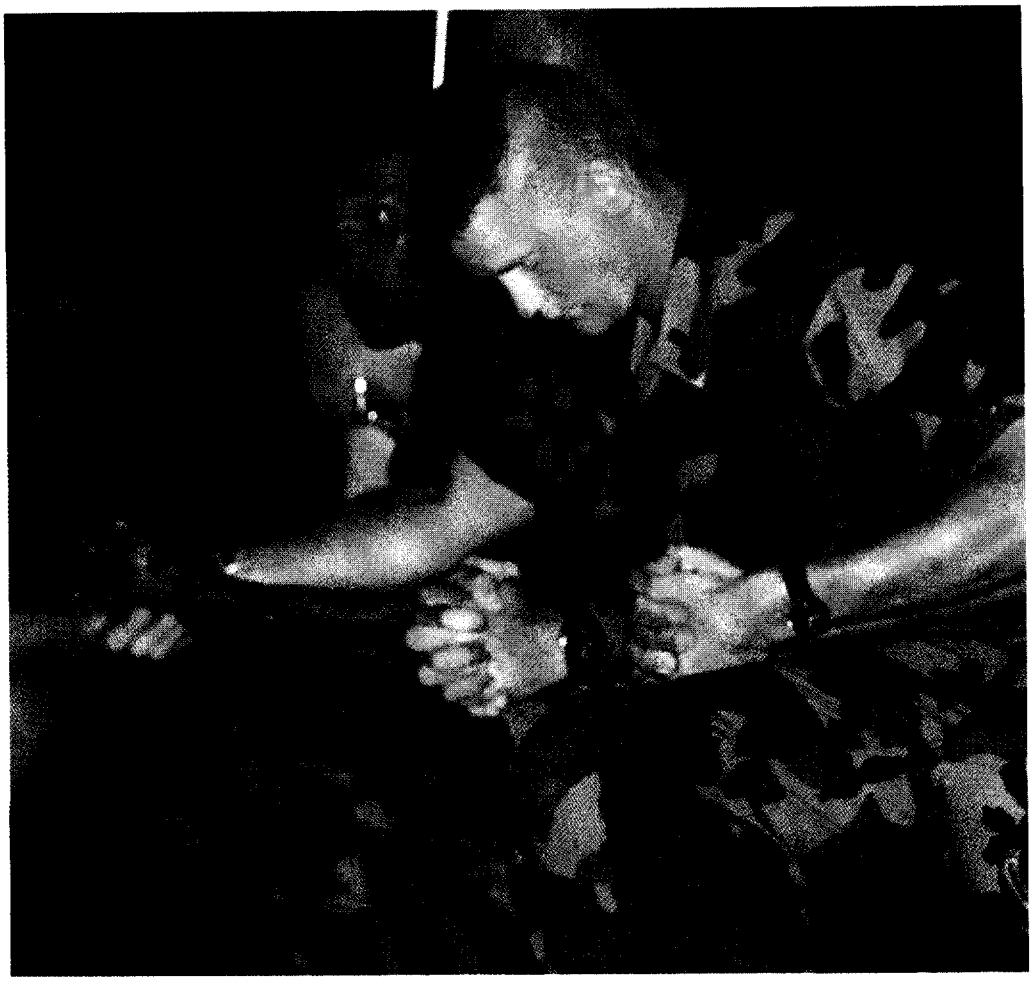
Air Force Civil Engineer Maj. Gen. James E. McCarthy has the focus of the CE mission at hand daily. His observations of Readiness Challenge V offered a measure of support for all involved.

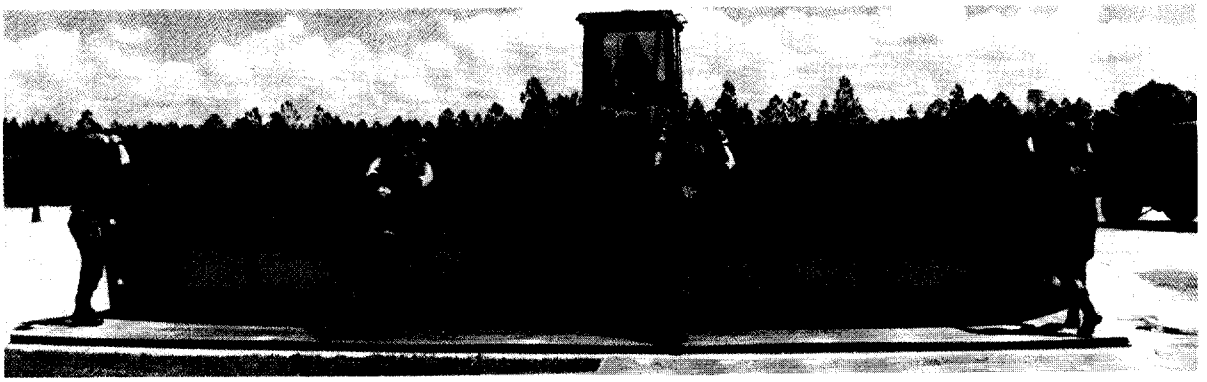
"The spirit and motivation of all the young men and women were very good," he said. "The key thing here is putting a number of organizations together — services, the agency, RED HORSE 823d — all working for the Air Force, not concerned with who gets things done, just pulling together to make it happen. That's what the essence of Readiness Challenge is all about." CE



"Everyone comes away with more respect for someone else's abilities than when they arrived."







"In the long run, this experience will provide the Air Force with a better, more well-rounded airman who has developed skills and may one day provide a commander with multiple assets if they're ever in a forward-deployed environment."

The results are...

"Every team had a plan. Every team attempted to execute it. Every team finished. One team won, but there were no losers."

Maj. Gen. James E. McCarthy Readiness Trophy
Air Force Special Operations Command
First runner-up
U.S. Air Forces in Europe
Second runner-up
Pacific Air Forces

CMSgt. William E. Morrison Award
Top Prime Readiness in Base Services (RIBS) Team
Air Force Special Operations Command
First runner-up
Air Force Materiel Command
Second runner-up
Air Combat Command

Brig. Gen. William T. Meredith Trophy
U.S. Air Force Academy
First runner-up
Air Force Special Operations Command
Second runner-up
Air Force Materiel Command

Maj. Gen. George E. Ellis Trophy
SMSgt. John Seely
U.S. Air Force Academy

CMSgt. Arthur J. Hanrahan Award
Top Prime Base Engineer Emergency Force (BEEF) Team
U.S. Air Force Academy
First runner-up
Pacific Air Forces
Second runner-up
Air Force Materiel Command

Canadian Trophy
Air National Guard
First runner-up
Canadian Forces
Second runner-up
U.S. Air Force Academy

Base Recovery After Attack
U.S. Air Force Academy
First runner-up
Air Force Special Operations Command
Second runner-up
Air Force Materiel Command

Force Beddown
U.S. Air Force Academy
First runner-up
Air Force Materiel Command
Second runner-up
Air Force Space Command

Hardback Construction with Tent Lighting Installation
Pacific Air Forces
First runner-up
U.S. Air Force Academy
Second runner-up
Air Force Space Command

M-17 Lightweight Decon Apparatus set up
U.S. Air Force Academy
First runner-up
Air Force Materiel Command
Second runner-up
Air Combat Command

Fire Search and Rescue Event
Air Education and Training Command
First runner-up
Pacific Air Forces
Second runner-up
Air Force Special Operations Command

Live Pit Fire Operations
Air Education and Training Command
First runner-up
Air Combat Command
Second runner-up
Air Force Space Command

"Winning wasn't the only objective....Being a contributing team member giving 150 percent on every effort was even greater."

"We weren't just stopping to use the bathroom and get something to eat. Everytime we stopped on the road to all the training sites, everyone got out of all the vehicles and changed cars before we pressed on. That way, we all got to know each other a little better."

Munitions Intelligence Procedures
Air Force Materiel Command
First runner-up
U.S. Air Force Academy
Second runner-up
Air Force Special Operations Command

Nuclear, Biological, and Chemical Survey Procedures
Air Force Special Operations Command
First runner-up
Air Combat Command
Second runner-up
Air Force Reserve

Rapid Runway Repair Damage Assessment
Air Force Materiel Command
First runner-up
U.S. Air Force Academy
Second runner-up
Air Force Special Operations Command

M-2A Burner Operations
Air Force Materiel Command
First runner-up
Air Combat Command
Second runner-up
U.S. Air Force Academy

Mobile Kitchen Trailer Setup
Air Force Special Operations Command
First runner-up
Air Education and Training Command
Second runner-up
Air Force Materiel Command

Pallet Build Up
Pacific Air Forces
First runner-up
Air Force Special Operations Command
Second runner-up
Air Force Space Command

Camouflage, Concealment and Deception
U.S. Air Force Academy
First runner-up
Air Force Space Command
Second runner-up
Air Force Materiel Command

General Purpose Tent Installation with Heater
Air Force Space Command
First runner-up
Air Force Materiel Command
Second runner-up
Pacific Air Forces

Sandbag Revetment Construction
U.S. Air Force Academy
First runner-up
Air Force Materiel Command
Second runner-up
Pacific Air Forces

Temper Tent Erection
U.S. Air Force Academy
First runner-up
Air Mobility Command
Second runner-up
Air Force Special Operations Command

Physical Fitness
Air Force Special Operations Command
First runner-up
Air Education and Training Command
Second runner-up
Air Force Materiel Command

Rapid Runway Crater Operations
Pacific Air Forces
First runner-up
Air Force Materiel Command
Second runner-up
U.S. Air Force Academy

Mobile Aircraft Arresting System Installation and Operation
Canadian Forces
First runner-up
Air National Guard
Second runner-up
Air Force Reserve

M-16 Combat Rifle Marksmanship
U.S. Air Force Academy
First runner-up
Air Force Space Command
Second runner-up
Air Mobility Command

PA Team Player
A1C Ron Gibson
Air Combat Command

PA Professional Performer
SSgt. Darrell Brewer
11th Wing

"This really gives people the right perspective of the Prime BEEF and RIBS training."

Services competes in RC-V

Story and photos by
TSgt. Andra Higgs
editor

There are few operations in the Air Force where Services personnel aren't involved and few, if any, amenities in the bluesuit life that they don't provide. This is water to douse any fanning embers to stoke a misleading flame about whether services personnel are vitally important to Air Force operations. They are!

"There are some people who think that we are only the towel boys and girls at the gym," said A1C Edward Castillo, services worker on the Air Force Special Operations Command team that finished first in the Prime RIBS competition. "If they could see what we do, just spend a day doing our job, those people would certainly have a greater respect for our profession."

It's not rocket science propelling a stratospheric transport vehicle piloted by a zipper-suited sun god, but a quick glance at the programs services provides, or for that matter, making these functions unavailable and there would not be a lot of happy air forcers: the fitness center, dining hall, recreation centers, marina landings, child development centers, officer and enlisted clubs, arts and crafts centers, tours and trips, shows and sports leagues, billeting, shoppettes and commissaries. Take these things away, and military service would be, well, miserable, at best.

"There's not a job in the Air Force that's not important, if it was, it wouldn't exist," said CMSgt. Nick Davis, an Air Force Academy team observer at RC-V.

OK, so the point is clear, or is it? How about mortuary affairs, linen exchanges, base exchanges, scuba diving lessons, recreational equipment rentals. In a deployed field environment, such as at Readiness Challenge, Services personnel provide, among other things, a place to eat, a place to sleep, and a place to wash dirty clothes.

"We provide people with an opportunity to relieve some of the stresses that can occur under field conditions," said Castillo.

At Readiness Challenge, civil engineers and services workers aligned as team members during the competition and those who worked to support the event did so much to the appreciation of competitors and visitors.

"Things here went real smooth. There was a lot of professionalism," said SSgt. James Mitchell, 437th Services Squadron, Charleston AFB, S.C., the Air Mobility Command team. "We came here together as a team. This wasn't about services or civil engineering and it's the same way at our home station. My experience has been that whoever and whenever someone can make things better, you do so — that's the bottom line. In this instance, the combined effort has made mission accomplishment an awesome experience. We don't worry about crossing some imaginary line. It's a team effort."

The Air Force Services Agency Chief of Plans and Readiness Maj. Gerald Barnes saw the competition as a skills-sharpening experience.

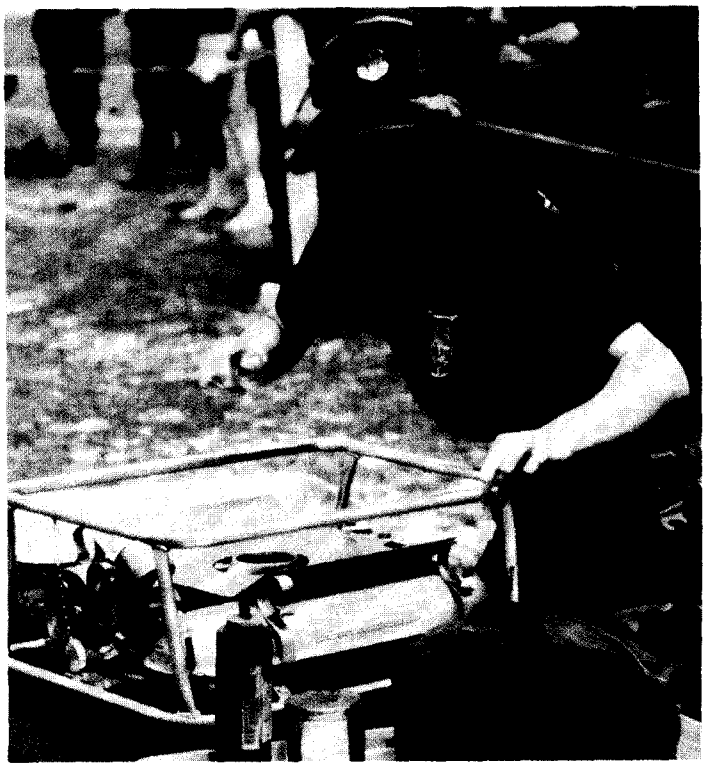
"This helps us to understand what our contribution is to the Air Force," he said. "Coming here as an observer, I can see what my Air Force brothers and sisters are supplying to the mission contingency arena. I was impressed so much by what all the teams were doing. Until I was able to come to this competition, I didn't have an appreciation for how the teams put their efforts together."

Brig. Gen. Eugene A. Lupia, then The Air Mobility Command Civil Engineer, saw the competition as a "tremendous opportunity" for teams of civil engineer and services personnel to gain valuable training and have an exchange of real-time ideas. "Events such as the Fog of War are about as realistic as it gets. For the teams from AMC, we've been involved in places from Rwanda to Somalia. This is an important event for the youngsters who need an understanding of the mission's mobility role," he said.

"As far as the real world goes, Readiness Challenge helps you think on your feet," said SrA. Shelvie Booth, an AMC services worker on the Charleston team. "This competition is not something that we get paid to do on a daily basis, and I think Murphy's law is what got our team — *this time*. If it could go wrong, it did. Win or lose, though, it's a matter of pride that we all wanted to do our best. I haven't been in the Air Force that long but, I know that it's the best air force in the world - point blank. This experience helped prove it. Everyone did everything with all their hearts and souls at Readiness Challenge."

Structures worker SSgt. Rick Felix, 11th Wing, Bolling AFB, Washington, D.C., echoed the sentiments about how the competition raises the learning curve for younger troops.

"The new troops get a chance to see what the big picture is all about," he said. "For some, the six months of training and then coming here to the competition was just too much pressure. Some weren't able to relax and just focus on doing their jobs. The issue wasn't about people knowing



Services worker TSgt. Kristine Gerkhe was a key performer on the winning U.S. Air Force Academy team.

their jobs, because we all did but, when it came down to doing it, everyone just wanted to do so well that some of us pressed."

The perpetuated notion that there exists some sort of strain in the relationship between services and civil engineer workers in a mobilized environment could be likened to a supposition of discord that may have existed at one time between active-duty and Reserve and Guard component forces. Frequency of mission collocations and joint training have long since dispelled any misimpressions about blue-suit capabilities on either side of the personnel resource table.

"The bottom line of realization is that we all see the value of working together, that's what this experience translates to, building firmly-knit teams," said MSgt. Ruth Duffy, 934th Airlift Group, an augmenting component on the AFRES team. "No matter where or what the mission, the bottom line is that when it's all said and done did we — as a Total Force — accomplish our mission?"

For MSgt. Dave Gregory, chief of Prime RIBS, Det. 1 823d RED HORSE, this was his first Readiness Challenge and he claimed not having "seen this kind of hoopla in years."

"I was impressed with competitors in every event I saw who were taking professional control and exhibiting great leadership of their teams during events and operations," he said. "The way that services and civil engineers worked together was like hand in glove. Without a doubt, I would say that the people who were here are ready to take on any challenge presented to them and carry out the mission with 100 percent effectiveness."

CMSgt. Ron Bolen, who has been involved with each of the five competitions — as a team participant, major command representative or as a detachment cadre staffer — said the experiences during the week-long competition provides some of the best wartime training available for airmen working in services and civil engineer career fields.

"Every Readiness Challenge, I come away with a sense of accomplishment," said Bolen. "The leadership backing this program has helped it immensely. The detachment professionals that supported this event at the Silver Flag Exercise Site are a class act."

"The people getting a chance to train, work and play together as a team is one of the reasons why we do this," said Air Force Services Agency Director Col. Steven Richards. "When you talk about the dedication and enthusiasm of each participant, then it becomes clear of the value we get from Readiness Challenge."

Founders receive badges

The Civil Engineer Founders, retired civil engineering general officers and civilian equivalents, gathered during Readiness Challenge V. In addition to viewing the competition and participating in the awards ceremony, they were briefed on several important civil engineering programs such as training and Prime BEEF restructuring. One of the highlights of the meeting was when the Air Force Civil Engineer Maj. Gen. James E. McCarthy presented each of them with the Civil Engineer Occupational Badge. Here, McCarthy pins the badge on retired Air Force Brig. Gen. William T. Meredith.

MEEP Introduces new products to the Air Force

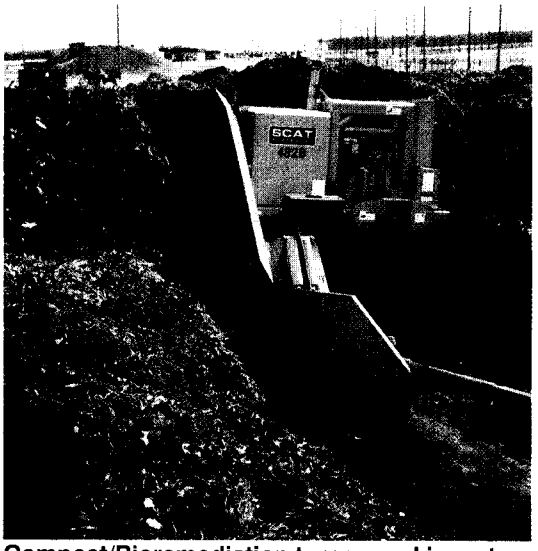
by Michelle Newsome
staff writer

Compost/Bioremediation Turner Inversion Conveyor

With the environment now a major concern for civil engineers, recycling has become a sign of the times. Seymour Johnson AFB, N.C., the 1994 Department of Defense Installation Recycling Award winner, continues to be on the cutting edge in recycling technology.

The 4th Civil Engineer Squadron's composting facility recently took part in the Air Force's Management Equipment Evaluation Program (MEEP) to test Scat Engineering's model 482BC, Compost and Bioremediation Turner Inversion Conveyor. This equipment helps accelerate the composting and bioremediation processes.

Operating a total of 41 hours during a period of less than four months, users utilized the unit to converts materials such as wood debris, leaves, grass clippings, shredded brush, tree limbs and pine needles into a finished compost product used for landscaping and as potting soil for house plants. Previously, a front-end loader was used to turn and blend the materials. This process normally took up to nine months for blending and degradation.



Compost/Bioremediation turner working at Seymour Johnson AFB, N.C.

The 4th CES reported the tow-type composter not only reduced the compost processing time, but also demonstrated substantial savings on equipment operation and manpower hours. During the evaluation, unit personnel reported a decrease in labor time by as much as 87 percent, while operating time was cut by almost 75 percent.

This equipment also provided for bioremediation processing and was used in cleaning petroleum-contaminated soils. To accomplish this task, the unit blended contaminated soils, compost and turkey manure. The bioremediation processing time for the tow-type composter was 15 minutes working on a windrow 200 feet in length, 18 feet wide, and 6 feet high, a marked decrease from the three hours required by past equipment. According to the manufacturer claims, the finished product can be used to backfill remediation sites and for base landscaping. Future projects for this equipment could possibly include treating underground storage tank excavation projects and jet engine fuel spills.

In addition to significant reduction in processing time, bioremediation advantages of the unit are superior mixing of ingredients and creating uniform windrows.

Due to the limited evalutation time, monetary cost savings could not be calculated. However, 4th CES officials were impressed enough to purchase the equipment.

COMBO-4

You're a maintenance supervisor preparing for another deployment. You need two air compressors to support a sand blaster and jackhammer, a generator to support your power tools, a welding machine and a light-all unit. Then you need to have the people to transport and maintain this equipment. Having space to store these items, could be quite an arduous task, but not if you have the COMBO-4.

The MEEP officials have completed testing of Construction Engineering's COMBO-4, a single unit combination of a 20-kw generator; a 185 CFM air compressor; a 400-amp stick, carbon, arc gouging, plasma arc, stud and scratch start, and DC gas welder with remote control; and two 500-watt Halogen lamps that are eight feet high. This unit, powered by a Ford 88 HP turbo-charged diesel with a fuel capacity of 49 gallons, provides 10 hours of operation.

Safety features include automatic shutdown for low oil pressure, high-water and cabin-temperature controls, and vandalism protection. The COMBO-4 can be mounted to a vehicle, towed behind a truck, or remain stationary.

The 27th Civil Engineer Squadron, Cannon AFB, N.M. used the COMBO-4 for a total of 107 hours over six months. During this time it was used for many different tasks,

Maintenance worker using the COMBO-4 at Cannon AFB, N.M.

including nighttime road and runway repairs and shop work. Occasionally, it was necessary for all the components of the unit to work simultaneously which users said it did without experiencing any problems.

In addition to versatility and convenience, 27th CES personnel said the COMBO-4 costs less if compared to the expense of separately purchasing each piece of equipment. The cost estimates on the purchase of two air compressors, one welding machine, one generator and a light-all unit were $56,000. The price tag on the COMBO-4 is $24,000. Prospective users should note that since this purchase would be cataloged as new equipment, similar assets will not have to be turned in. Also, it was noted that depending on this unit alone would be unwise; when down for maintenance it would effect all four operations.

"The COMBO-4 would be an ideal mobility asset. During Desert Shield/Desert Storm our squadron was forced to buy a welding set. The delays experienced during procurement and shipping degraded some of our mission performance that could have been avoided had we possessed the COMBO-4 unit," said SSgt Roger Smith, Prime BEEF NCOIC. "The COMBO-4 unit exceeded our expectations in its performance and reliability."

War: Aviation Engineers' unconventional methods get job done

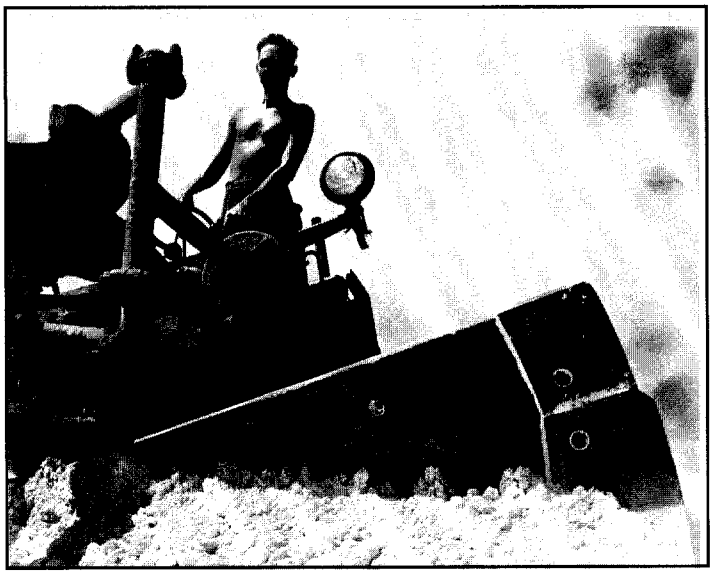
Continued from Page 15

Hollandia, and Morotai Island. Engineers had hoped to use captured Japanese airstrips, but these proved so inadequate it was hard to see how even the unpampered enemy could ever have used them. Airborne Aviation Engineers and their equipment arrived at Tsili Tsili by C-47 and upgraded an abandoned airstrip into an airfield for fighter aircraft in just days. At Tacloban, on the island of Leyte, Aviation Engineers built a 7,000-foot runway using pierced steel plank in spite of hundreds of land mines and aerial attacks, one night experiencing 71 separate passes by enemy aircraft. They continued building airfields, progressing toward Manila and the northern Philippines.

China-Burma-India

In the China-Burma-India Theater, the activities of the Aviation Engineers were as far from normal as were most operations in that vast theater of operations. In China, only a handful of Aviation Engineers was available to advise Maj. Gen. Claire L. Chennault, commander, 14th Air Force, on airfield construction. Hundreds of thousands of Chinese carried out the work, using whatever methods were available. Chinese men and women carried heavy loads of earth, stone, or other building materials in twin baskets slung from poles carried across their shoulders. Rollers were drawn by singing teams of Chinese, often a hundred or more to each roller. The American principle of installing drainage first to protect the subgrade from the softening effect of standing water was often very difficult to apply. The Chinese engineers, in the habit of installing the drainage system last, would clinch the argument with the often heard and almost unanswerable reply that, "We have been doing it like this in China for 2000 years."

In India, the 10th Air Force used fields prepared by native labor under British supervision. The 900th Aviation Engineer (Airborne) Battalion completed a noteworthy project in the jungles of Burma. The glider-borne troops constructed an airfield behind enemy lines at Myitkyina in support of Maj. Gen. Charles Wingate's famous Chindits. From 1942 to 1944, five aviation engineer battalions, trained for airfield construction, worked on the Ledo Road that stretched from India to Burma to carry supplies on to China. Their fine work was finished only with the completion of the road, and, though some units then moved into China, they arrived too late to accomplish much before V-J Day.



Member of an Aviation Engineer battalion operating 12-foot grader during October 1945 construction of Guam airfield.

Pacific Ocean area

The island-hopping campaign across the Pacific was essentially a continuous struggle for air bases. Aviation Engineers and Seabees worked together, but often with a sense of competition, to provide the airfields on newly-captured islands. They constructed air bases on islands with names such as: Christmas, Ellis, Tarawa and Kwajalein. American aircraft were flying missions from these new facilities often before the Japanese were even aware that construction was underway. These bases were critical because they practically eliminated the need for vulnerable aircraft carriers to linger in enemy-infested waters and offered an opportunity for bombers to directly attack the Japanese homeland.

New aircraft entering the inventory presented tremendous challenges for Aviation Engineers. The airfields proposed for the Marianas (primarily Saipan, Tinian, and Guam) were of unprecedented scale in order to accept the giant B-29s. The bombers required smooth, finished runways of asphalt or concrete, each 8,500 feet by 200 feet. One airfield had seven miles of runways and a 450,000 square foot warm-up apron. Five 800-man battalions worked around the clock at Saipan, battling coral, bad weather, and 300 Japanese infantrymen brandishing axes and automatic weapons who attempted to overrun the site. Engineers also constructed airfields on Guam, while the Seabees built runways on Tinian. In all, these airfields hosted five B-29 wings, totaling some 720 aircraft. These included the *Enola Gay* and *Bock's Car*, aircraft used to drop the atomic bombs on Hiroshima and Nagasaki.

Army Air Force leaders planned a massive airfield construction effort on Okinawa to support an expected invasion of Japan. On V-J Day, 26 battalions were working on six airfields that included 25 miles of paved runways and parking aprons with enough concrete to build 40 miles of two-lane highway.

The Aviation Engineers' experience in the Pacific was quite different from the European work where engineers were under the direct control of Army Air Forces commanders and were used almost exclusively on airfield construction. Although this was not the case in the Pacific, the engineers still carried out their work in the face of untold obstacles, confusing lines of command and control and conditions they had never anticipated. Their remarkable engineering feats—the Ledo Road, Port Moresby, Myitkyina, and countless other projects played a major role in winning the war in the Pacific and set the standard for other engineers to match in the future. EE

BOOKMOBILE WITHOUT WHEELS

The Contract Support Division has made our ***library of service*** contract performance work statements (PWSs) and other contract elements available electronically, directly ***through the Internet***. The library can be reached through the existing AFCESA Home Page, or directly through a new Contract Support Home Page. The Universal Resource Locator address is ***http://www.AFCESA.af.mil/AFCESA/Contracts***. This arrangement will allow any base with an Internet connection to browse and download any files in the library for their own use in preparing new service contracts. (Ron Smith, DSN 523-6372)

DISASTER PREPAREDNESS TRAINING PACKAGES (DPTPs)

We recently ***updated four Disaster Preparedness training packages***. The revised lesson plans are: M256A1 Chemical Agent Detector Kit (F2), M8A1 Automatic Chemical Agent Alarm (F3), Wartime Decontamination of Chemical/Biological Agents (G2), and Wartime Chemical Contamination Control Area (CCA) (G5). These training packages are distribution "F" and ***will soon be available on an electronic bulletin board system***. As of June 1995, ***Disaster Preparedness Training Packages were renamed to Readiness Training Packages*** and will include subjects required for Prime BEEF home station training. (TSgt. Reed, DSN 523-6160).

IT SAYS SO, RIGHT HERE IN THE BOOK

Air Force Dormitory Manager's Workbook, was developed by Mr. Ed Ewell (HQ ACC/CEHP) for use by dormitory manager's and their staffs as a ***management tool for dormitories***. It provides needed background information and instructions on all aspects of dormitory management and offers simple and ***useful solutions*** to common dormitory management problems. The ***workbook also contains seven chapters*** of valuable information, including suggestions on how to establish dormitory occupancy goals, develop room assignments, etc. It is intended as a self- taught course with self-taught tests at the end of each chapter. The workbook ***was distributed*** Air Force-wide on in April. If, however, your office didn't receive a copy, contact Mr. Ewell, DSN 574-3528.

THE COURSE IN THE MAIL

The Fire Service Instructor II (Course #10412) and Fire Service Instructor III (Course #10413) ***courses are now available*** through the ***Extension Course Institute***. Since neither of these courses are required for upgrade training, students have 12 months to complete each of the courses. We are still ***working on the fire officer series*** and hope to have the Fire Officer III certification course accredited and available in the fall or 1995. (MSgt. Blankenship, DSN 523-6221)

ON SECOND THOUGHT

The office of the Secretary of Defense (Environmental Security) recently staffed for approval of a final DoD ***overseas environmental remediation policy***. It addresses MAJCOM and air staff concerns raised over previous versions and includes all service, Defense Logistics Agency, joint staff, and OSD comments collected over the past year and a half. It will take the place of their December 1993 message which established environmental restoration policy for overseas installations ***identified for return to host nation***. Additionally, it will establish restoration policy for active overseas installations remaining open. The policy will provide overseas commanders ***maximum flexibility in managing*** their environmental remediation responsibilities and resources. This final version complements Air Force cleanup policy outlined in Chapter 2 of AFI 32-7006, April 1994. (Mr. Neil Rochelle, DSN 227-3361)

READY, AIM . . .

The Department of Defense is circulating for comment their final draft version of the DoD policy on the application of CERCLA and RCRA to DoD ***small arms ranges*** including services skeet ranges. The ***intent of the policy is to clarify*** the limited situations where CERCLA and RCRA apply. The draft policy was distributed to all MAJCOM/CEVs and HQ AFCEE/CCR for review and comments. (Maj. Marty Duke, DSN 227-3360)

LOOK, UP IN THE SKY, IT'S A BIRD . . .

Guidelines were forwarded in June from the Environmental Protection Agency to all major commands for the ***1995 EPA Stratopheric Ozone Protection Award*** nominations. The format for the submittal packages is the same as last year. They must include a two-page application form (included in the nomination guidelines), a one-page summary of the project or person/team being nominated and any other background information you wish to submit that supports the nomination. This year you may ***submit nominations directly to the EPA***, with courtesy copies sent to our office. We will keep a reference file of success stories for future reports. (Maj. Keith Smith, DSN 227-2550)

SOMETHING IN THE WATER DOESN'T COMPUTE

A Clean Water Act (CWA) Workshop will be held in Atlanta, Ga., August 1-2 1995. Day one of the conference will address key issues such as impact of ***deicing fluid, engine washout rinsewater, AFFF disposal, stormwater update***, funding overview, FFCA updates and others. Day two of the conference will be on new technologies, developments, MILCON Program, and ***common problems and strategies***. This conference is co-sponsored by HQ AF/CEVC, AFCESA and AFCEE. Expected audience would include HQ AF, AFCEE, AFCESA, MAJCOM representatives, one or two base staffers per MAJCOM, JACE, Armstrong Labs and others. (Mr. Combs, (214) 767-4671)

A GREEN THUMB

A landscape assistance team visited Malmstrom AFB, Mont., in June at the request of Space Command and base engineering personnel. The team was tasked to analyze and ***recommend installation landscape*** architecture improvements and design six projects. The main base avenues, base dormitories, administrative facilities and visiting officer's quarters were analyzed and designed. In addition, base landscape aesthetics and maintenance guidelines were addressed. An area plant list was accomplished as well. The ***base civil engineer*** expressed his immediate interest in using the designs and completed study to accomplish the projects as soon as they could be funded and programmed. The support by photo lab, graphics and civil engineer personnel was superior. Their support of the project with color photo reproduction and booklet formatting added greatly to the study document. (Maj. Smith, DSN 240-4195)

CYBORGS UNITE

The Naval Facilities Engineering Service Center (NFESC) hosted a ***Pollution Prevention Technical Library*** Working Group meeting at the University of Tucson's "Groupware" facility to discuss the Defense Department (P2) technical library. The meeting was attended by ***Navy, Army, Marines and Air Force representatives*** for the purpose of deciding the scope and content of the library. Future working groups will be held quarterly. The "Groupware" facility was valuable for this type of effort because it allows a group of people ***to interactively brainstorm***, prioritize ideas and produce an electronic record of all meeting activities. (Ms. Kivela, DSN 240-4191)

NOT SPEED RACER, IT'S . . .

The first publication of the quarterly ***RACER Dispatch*** was sent to the more than 950 registered users. It is the intent of the newsletter to act as a ***sounding board for RACER*** (Remedial Action Cost Engineering and Requirements) related information from RACER system users. Future articles will include user projects, **hot tips, sample problems**, etc., provided by RACER users. (Mr. Thomas Ove, DSN 523-6186)

FOUR OF THOSE AND THREE OF THESE . . .

Plans are under way for training individuals involved in ***military construction*** processes on the latest release of **PACES** (Air Force Parametric Cost Engineering System) which includes estimating renovation-type projects. Training should take place between July-September 1995. The contractor, ***Delta Research Corporation***, will travel to major command locations to offer the ***three-day class***. (Mr. Wesley Hammond, DSN 523-6261)

ROAD TRIP

Wessex Institute of Technology, Southhampton, United Kingdom, and Dartec Limited, Stourbridge, UK, are co-sponsoring the first **International Conference** on Computational Methods and Testing for Engineering Integrity, March 19-21, 1996, Kuala Lumpur, Malaysia. During the three-day session, attendees will ***assess the engineering integrity of materials, components, structures and systems*** as a fundamental requirement of engineering design and analysis. The utilization of computers and the development of sophisticated software for testing facilities will also be explored. Final delivery date for papers is October 20, 1995. Also, the WIT and Kyushu University, Fukuoka, Japan are co-sponsoring the 4th International Confernece on Computer Aided Assessment and Control of Localized Damage, Jun 3-5, 1996, Fukuoka Japan. This conference is being organized to ***promote further international cooperation among scientists and engineers*** from different disciplines involved in the study and assessment of localized damages, with an objective to produce an integrated approach to the problem of fracture, fatigue and safe design, with emphasis placed on the ***application of advanced theories***. Final papers are due by February, 1996. Other scheduled conferences include: the quarterly ***Nuclear, Biological and Chemical Defense Working Group***, August 15 - 17, Brooks AFB, Texas; the ***Civil Engineer Readiness board***, August 21 - 25, Tyndall AFB, Fla.; the American Defense Preparedness Association Camouflage, ***Concealment and Deception Symposium***, September 11 - 14, Fleet Combat Training Center, Dam Neck, Virginia Beach, Va. Point of contact for conferences is Mrs. Liz Kerr, CMT96 Conference Secretariat, WIT, Ashurst Lodge, Ashurst, Southampton SO40 7AA, U.K.; or via phone, (441) (703) 293223; or, Email: cmi@ib.rl.ac.uk

WIMS ASSISTANCE AVAILABLE

The Field Assistance Branch is part of the Headquarters Standard Systems Group, Gunter Annex, Maxwell AFB, Montgomery, Ala. As a 24-hour help desk for computer and software support, the FAB answers questions about more than 145 different automated data systems (ADS). Supporting that many ADSs is a task that takes four specialized teams to perform. ***AFCESA*** technicians will transfer all Work Information Management Systems software to SSG and Team 1 of the FAB by September 1995. Assistance is available at DSN 596-5771 or commercial (334) 416-5771. For all WIMS applications (system code WI), punch in "1" for team number 1. If your have a less pressing issue you can email to fabmail@b875S1.ssc.af.mil. You can also send a FAX to DSN 596-3077 or commercial (334) 416-3077. Please mark the FAX with "ATTN: HQ SSG/SSFA." (Mr. Stuart Millard, DSN 523-6333)

EPA REPORT—FY 94

We have reviewed EPA's Enforcement and Compliance Assurance Accomplishments Report for FY 94. During FY 94 EPA brought a record 2,246 enforcement actions with sanctions. This record included 220 criminal cases, 1,596 administrative penalty actions and 403 new civil referrals to the Department of Justice. EPA also reported that the states issued 11,334 enforcement actions during this period. During this period, AF enforcement actions dropped from 207 open actions at the end of FY 93 to 126 at the end of FY 94. Also of interest is that the entire EPA report, while containing several references to Army, Navy or Coast Guard facilities, does not contain any reference to AF installations. (Maj Carr, AFCEE/CCR-D, (214) 767-4654)

CLOSING THE DUMP

England AFB's BRAC restoration program reached a major milestone 8 Jun when the Louisiana Department of Environmental Quality issued formal notice of the closure of England's former Defense Reutilization and Marketing Office Hazardous Waste Storage Area. This action culminates 23 months of effort beginning with the award of a project in Jul 93 for DRMO cleaning and confirmatory sampling. (Mr. Waterman, AFCEE/ERB, DSN 240-5209)

Vandenberg: Strategic fire plans burn away hazards

Continued from Page 19

training, that if they see something which appears to be unsafe, to speak up."

Safety nothwithstanding, it would appear improbable that a 20-person team could be a pivotal factor in fighting wildlands fires. At Vandenberg, Hot Shots work to combat wildfires by strategically burning areas of the base to create vast breaks in the dry topography, hopeful that such efforts will prevent a complete land mass envelopment during a major fire.

Once a fire has started, however, crews would set fires to shift the burn path away from prime fuel bed, major structures or base facilities.

The strategy of setting blazes to create fire breaks or shift the path of a blaze was employed during a 20,000-acre fire that occurred following the June 1993 detonation of a Minuteman missile that strayed off course 10 seconds after liftoff. While brush burned on one of the base's northside ridges, the focus became preventing the fire from rolling over the hills on a path toward a local small town. Similar strategies were used successfully during the 1993 140,000-acre Los Padros Fire that lasted nine days and the Highway 41 Fire that burned for a day and a half and threatened three cities — San Luis Obispo, Morro Bay and Santa Margarita.

"This is a totally different set of rules than walking off an engine or a crash truck," said Firefighter SrA. Michael Gambill. "When you walk into this (wildland fire training), you start at ground zero. There are some things you carry from one area to the next, as far as aircraft or structure fires are concerned but, this is high education for fighting wildland fires."

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Future enhancements to Vandenberg's fire protection and prevention mission will incorporate the Global Information System, a computer-based integration program that is expected on-line within the next few months. This system, incorporating firefighters, engineers, environmentalists and other base planners will help determine which areas require controlled burns. The decision is based on the age of the brush, amount of fuel it provides and other factors acquired by utilizing infrared and satellite imagery and records of all previous construction. This new system will also assist in preventing the erosion of the base's natural resources, including Native American burial grounds, and sensitive ecological areas such as Monarch Butterfly migratory locations and Snowy Plover nests. All these considerations impact fire fighting tactics.

"A lot of the plant species on base need fire to regenerate themselves," said Marko. "Most of the shrubbery is 20- to 30-years-old, and 80 percent of it is dead. There are sections of the base, such as deep canyons and gorges, that it wouldn't be wise to have *even* controlled burns; so, controlled burns in areas where they are possible is vitally important to protecting the base."

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The experience provided by the multi-mission fire department has also been a career enhancement for SSgt. Eric Harper, an 11-year veteran who's been on station for 12 months following a tour at now-closed Norton AFB, Calif.

Hot Shots use hand tools to create a fire break in smoldering brush.

"As a staff sergeant, I'm getting a lot of opportunity here," said Harper. "Working with the civilian force, we develop a continuity for getting things done. Fighting the wildland fires here is very different than at any other base. We have to be sensitive to a host of issues and deal with regulatory measures to keep this a safe and well-protected facility."

Environmental protection and OSHA laws within the county of Santa Barbara and state of California are among the nation's strictest. Requirements for compliance have initiated shifts in the types of agents used to fight fires. This has also meant additional state and federal training mandates for hazardous materials handling. Many of the Vandenberg firefighters hazardous material concerns center around the missile and space vehicle launch programs which use toxic hydrogen- and nitrogen-based chemical components as propellants.

Most launch-pad rescue scenarios include firefighters from three on-scene response vehicles climbing any of the 300-foot launch pad via exterior stairs with about 120 pounds of gear strapped to their backs. "After everything is deemed safe for us to go in, our biggest concern would be retrieving contractors or technical representatives," said Marko. "With the rubber suit, breathing apparatus and other equipment, it puts a lot of stress on our firefighters' ability to be effective. Although they'll have about 45 minutes of oxygen in their bottles, they are probably only going to be able to operate for 10 to 15 minutes before we pull them out."

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Agency establishes Board of Advisors

by Dennis Firman
Executive Director, AFCESA

Serving our customers--the base civil engineers--is the paramount mission of the Air Force Civil Engineer Support Agency. To provide the best possible support, we established a Board of Advisors to review our ongoing efforts to tell us whether our programs are meeting your needs. The Board will also give us recommendations on where AFCESA can boost our technical support for the entire Air Force Civil Engineer Community.

A cross-section of headquarters and base-level people were brought together on March 23, 1995 for the first Board of Advisors meeting. Individuals selected by HQ USAF, AFCEE, direct reporting units, and major commands as their representatives were: Col Thomas M. Griffith (Chairperson), HQ AMC/CEV; Col Dwight E. Clark, HQ USAF/CEO; Col Patrick M. Coullahan, 3 CES/CC; Col Larry L. Enyart, HQ USAF/CE(MA); Mr. Paul Parker, HQ ACC/CEO; Col Samuel G. Lundgren, NGB/CE; Col David S. O'Brien, 96 CEG/CC; Mr. Anthony Zugay, AFCEE/CD; Mr. Robert D. Mack, HQ AMC/CEO; Lt Col James E. Judkins, 11 CES/CC; Lt Col Phillip J. Legrand, 16 CES/CC; Mr. Thomas M. Mitchell, 10 CEG/CD; Mr. William J. Porr, 81 CES/CD; and Mr. Tom Smith, 52 SPTG/CE.

The first meeting produced outstanding results—three major recommendations of the Board of Advisors were that we hold a communications workshop with MAJCOM and base-level customers to determine how to improve communications between the Agency and the field, assess structural fire risk for possible savings in manpower, and look at ways to improve the delivery and availability of technical support services to the field. The Agency immediately took action to implement their ideas. The communications workshop is in the planning stages to be conducted this fall. Our Fire Protection division is establishing a team to evaluate correct application of DOD manning standards for structural fire protection. This evaluation could result in manpower savings, which could then be realigned within the CE squadron. Agency Grams (A-Grams), a new method of getting technical information out to the individuals who need it most, are being generated monthly. The A-Grams are a success story in themselves, receiving an overwhelmingly favorable response from the field.

The Board also provided positive feedback to us on the computer support we provide to the major commands and applauded our efforts in establishing a contracts division in our Operations Support directorate. As civil engineering units downsize and turn to contractor support, the need to write and award contracts will become more prevalent. This is where our contracts division can assist. Already they have developed a library of performance work statements that are accessible through the computer, and they are preparing a Services Contracting handbook to further assist our customers.

Our next Board of Advisors meeting will be in October 1995, and we would appreciate your ideas on how we can improve our products and services. Talk with your Board of Advisors representative and help us maximize the effectiveness of this customer feedback session. Helping you do your job better is AFCESA's Job One!

Like most fire departments, the volume and variety of calls are frequent and wide-ranging, including requests for ladders to rescue cats and birds from trees or people mistakenly reporting harmless air-conditioner condensation as a car fire.

"There is hardly anything on base that goes on without us being involved," said Fire Chief Paul Giles. "In most instances, we act as the on-scene commander until the wing commander shows up. We are the sidewalk supervisors, and you wouldn't believe the calls we get to respond to."

No matter the nature of the request, fire department personnel respond — in one of 30 emergency vehicles — with the same sense of urgency. Frequently, though, the seriousness of a particular call may require the utilization of specialized operations.

Ten firefighters are trained, in conjunction with the Santa Barbara County Search and Rescue team, for cliff-side and confined-space extrication.

Retrieving rock climbers stranded on ledges, recovering distressed boaters or extracting rocket scientists from underground missile silos are all part of the special tasking for this unit, according to Lt. Robert Begley, crew leader.

To match the logistical challenges of the high- and low-angle and confined-space rescues, the 10 Vandenberg firefighters on the cliff-side rescue team rely on school-house training and high-tech equipment.

"We teach all our people how to rappel or how to snatch someone from a crevice using rigs and harnesses," said Begley, indicating that some form of the team has been in operation since 1975. "The biggest advances have been incorporating safety standards into the operation as they relate to the use of ropes and belts."

According to Begley, replacement of the three-strand, twisted manila rope with 150- and 300-foot nylon-based Kerrimantle ropes, which have only a two-to-three percent stretch factor is a dynamic advancement from previous practices.

"We've learned to better anchor rope to vehicles or several shallow-rooted plants when pulling people from cliff sides," he said, indicating that most rescuees are weekend rock climbers who get stuck. However, he notes that there have also been more stunning incidents, such as a baby falling out of a parent's backpack and over the cliff's edge to the rocky shoreline nearly 100 feet below. "Having our people EMT trained has made our teams better able to recover victims."

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A recently acquired airdrop water bucket fire fighting mission requires the use of a 300-gallon fiberglass container that can be tethered to a helicopter. The unit has two buckets which have hydraulically-operated doors that can be remotely opened and closed by the helicopter's flight engineer. A 5,000-gallon refill bladder can be strategically placed to maximize airdrop mission utilization.

To date, the helicopter hasn't dumped water on a live fire but has accomplished about 200 practice drops. This mission, similar sense of urgency. Frequently, though, the seriousness of a to the cargo sling operations Vandenberg's 30th Rescue Squadron performs for the Army, will give the unit's aircrews an opportunity

*See **Fire**, Page 49*

IN THE LAB

Laboratory consortium wins technology award

by Larry Testerman
Armstrong Laboratory Environics Directorate

An environmental research engineer assigned to Armstrong Laboratory's Environics Directorate at Tyndall AFB, Fla. has been honored by the Federal Laboratory Consortium. Bruce J. Nielsen is a recipient of the coveted 1994 Technology Transfer Award.

Nielsen was honored for his efforts in development and commercialization of a turntable laser spectrometer for characterization and monitoring of fuel-contaminated sites. The need for this technology is acute because the Department of Defense has more than 10,000 contaminated sites that must be cleaned up. The estimated cleanup cost is more than $24 billion; as much as one-third is attributable to characterization and monitoring costs. Present methods, such as drilling boreholes or monitoring wells and sampling, are expensive and time consuming.

Bruce Nielsen points to the laser window in the cone penetrometer rod used as part of a recent ROST demonstration at Kelly AFB, Texas.

A method was needed to give environmental planners information about the location, type and amount of contamination, as well as to monitor the progress and success of cleanup procedures.

In previous efforts, Nielsen had integrated the turntable laser spectrometer by fiberoptics to a cone tipped rod, equipped with sensors, into the ground. The system displays sensor information about the soil contamination by relaying an instantaneous flourescent "fingerprint" to a computer screen.

Nielsen initiated a partnership between Armstrong Laboratory and private industry that began with a Cooperative Research and Development Agreement. A proposal was then submitted for Technology Reinvestment Project (TRP) funding from the Advanced Research Projects Agency

*See **ROST**, Page 46*

Discovery Channel crew visits laboratory

by Mary Elaine Reynolds
Armstrong Laboratory Environics Directorate

Photographing the flightline, jets landing and taking off, and fuel storage tanks were included in the activities of a film crew from the Discovery Channel during a visit to Tyndall AFB, Fla., to film a segment of *"Today's Environment."*

"Today's Environment" is a cablevision presentation which highlights contributions to preserving, protecting, and cleaning up the environment. Their show is narrated by Ed Begley Jr.

Armstrong Laboratory, part of the Air Force Human Systems Center, is the Air Force's lead laboratory for environmental quality. The Discovery Channel officials became interested in Armstrong Laboratory's environmental quality efforts upon reading some of the Environics Directorate's fact sheets and published articles.

According to Environics Director, Col. Neil Lamb, "We welcomed the opportunity of exposure on *"Today's Environment."* Our scientists and engineers are dedicated to the proactive development of technologies needed by our commanders and civil engineers for cost-effective and environmentally acceptable operation of their bases. At the same time, we consider ourselves to be on the cutting edge of environmental quality, because virtually all of our technologies are transferable to the civilian community."

The filming began with bench scientists working in a high-tech, state-of-the art laboratory, then continued to the Tyndall flightline to film jets landing and taking off, fuel tanks and other activities as a backdrop to video footage of pollutant characterization and remediation of a fuel-contaminated areas. Tyndall filming also included a pilot-scale bioreactor for biodegradation of rocket fuel wastestreams. The activities filmed at Tyndall and some videotapes at other bases provided a final 5-minute segment on biotechnology.

The ultimate value of this national television exposure helps tell the Air Force environmental quality story as it traces efforts from the laboratory to development of technologies that are transferable to the entire world.

According to Larry Testerman, coordinator for the filming project, "All too often, the Air Force and Defense Department are perceived as agents of environmental devastation, because we are devoted to developing weapons systems and technologies to defend our country. Of course, our business is maintaining readiness, but we are also concerned with the quality of life for America and the world. We are proving we can have readiness with minimal environmental impact and that our cleanup efforts will enhance environment sustainability."

The *"Today's Environment"* segment was originally broadcast on the Discovery Channel during the month of April. Consult your local television listing for rebroadcast dates and times.

Bioreactors clean contaminated groundwater

by Larry Testerman
Armstrong Laboratory Environics Directorate

Robins AFB, Ga., provided the test site and the Defense Department provided the funding as a Small Business Innovative Research contractor demonstrated an effective technology for cleanup of contaminated groundwater.

This partnership, between Armstrong Laboratory's Environics Directorate and Envirogen Inc., resulted in design and field-testing of a two stage bioreactor. In the process, contaminated groundwater is pumped through the bioreactors, where microorganisms "eat" benzene, trichloroethylene and other chlorinated solvents.

The two-stage bioreactor was fabricated and tested for two months, using water pumped from a contaminated area. The first-stage bioreactor degraded over 96 percent of the benzene. Water containing residual benzene and trichloroethylene was fed toa second-stage bioreactor which biodegraded over 90 percent of the trichloroethylene and 96 percent of the remaining benzene.

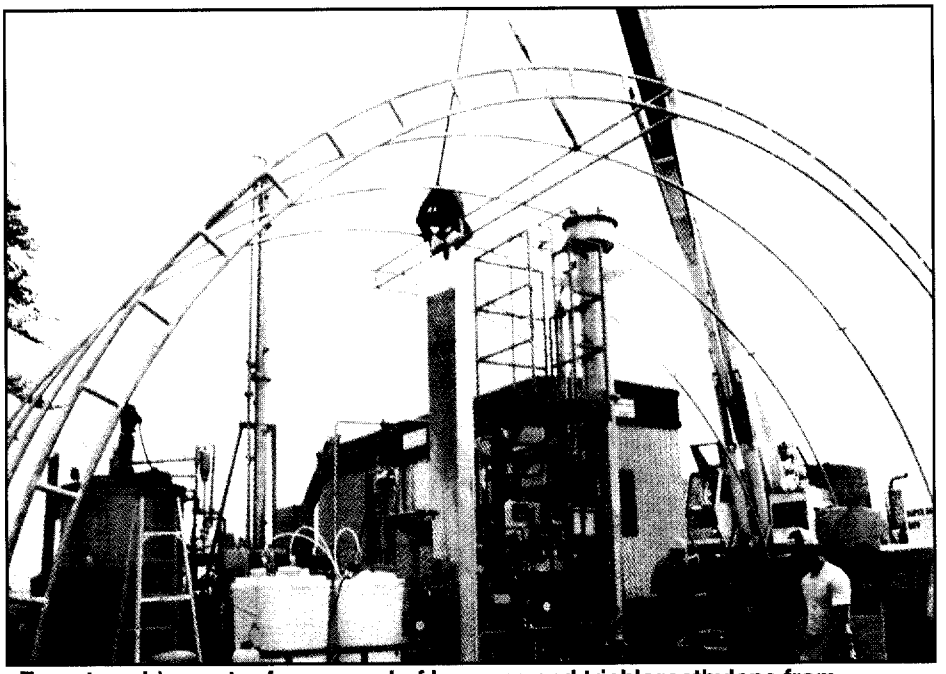
Maj. Kenneth W. Branton, chief of environmental restoration at Robins said "The project should prove that biological treatment offers a convenient, effective and reliable method for destroying contaminates in groundwater without polluting the atmosphere or transferring the contaminant to another phase that requires further treatment or disposal."

The success of this project is important because more than 800 sites have been identified with chlorinated solvent contamination. Trichloroethylene is the most frequently found chlorinated solvent, often coexisting with JP-4, which contains benzene. Armstrong Laboratory has been a pioneer in the use of bacteria that will biodegrade JP-4, but trichloroethylene contamination has been a major problem.

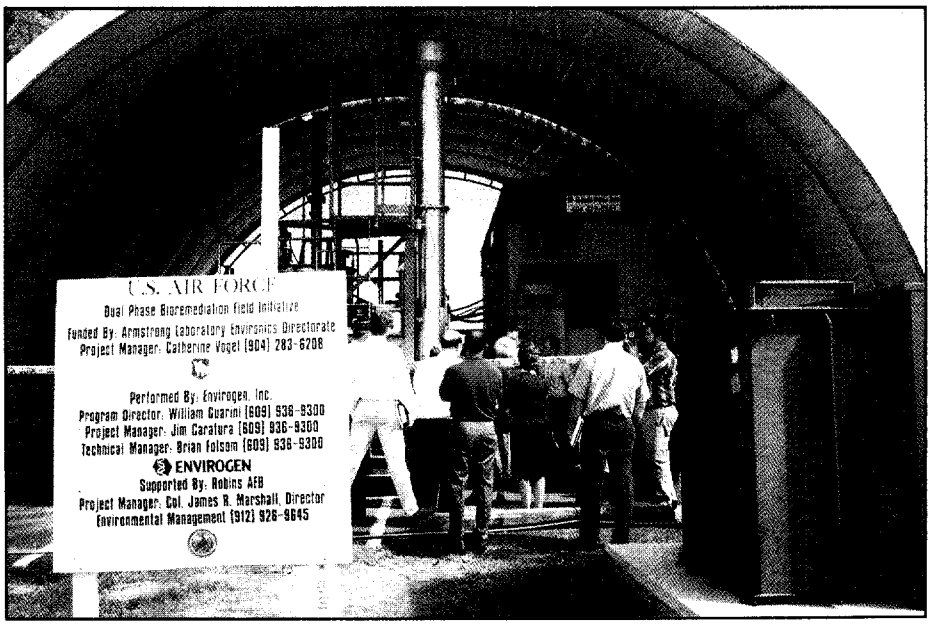
Cathy Vogel, Project Manager for Armstrong Laboratory's Environics Directorate, is excited about the success of the project.

"Although bioreactors provide an important baseline for biotechnology development, they do not represent the ultimate in cleanup of contaminated sites," she said. "We can use the bioreactors to treat the residuals from such processes as air stripping and soil vapor extraction. Perhaps the best thing is that we may be able to extend this technology to treat trichloroethylene-contaminated sites at the source, without having to pump the water through a bioreactor; just as we have with JP-4.

"This is not just an Air Force or even a Department of Defense problem. Many industrial sites across the United States and even the world must clean up sites contaminated with these fuels and solvents," she said. "In short, we are dealing with a highly transferable technology." CE



Two-stage bioreactor for removal of benzene and trichloroethylene from groundwater at Robins AFB, Ga.



Demonstration of two-stage bioreactors at Robins AFB, Ga.

McCarthy: Protecting natural resources vital to Air Force

Continued from page 7

drive down the costs, which are enormous. In the compliance area, which is basically insuring that today's operations comply with today's standards, our measure of merit has been notices of violation (NOV). In a matter of three years, we have gone from about 256 NOVs down to 80. We are four years ahead of the Defense Department goal. To me, that is spectacular.

Our training establishment has also responded. Gen. (Henry Jr.) Viccellio has ensured that all of the AFSs in the Air Force have environmental issues integrated into their training. The environmental aspects of being a jet engine mechanic are woven throughout the period of training, not just in a short 30-minute video or lecture. The Environmental Leadership Course that Gen. Viccellio helped us inaugurate when he was the deputy chief of staff for Logistics and Engineering has been great. In this course, the major command, numbered air force and wing commanders sit down for a day and a half with our environmental staff and address environmental awareness issues and solutions. A good example of the course's impact was seen recently in Air Mobility Command. The 21st Air Force Commander Lt. Gen. Mack Armstrong, declared they were going to become NOV free and they delivered! That command, 21st Air Force, is now NOV free.

Two other areas of environmental concern come to mind: pollution prevention, and preserving and protecting our natural and cultural resources. The production of hazardous waste and solid waste is way down. We are having significant results in the weapon system area. The F-22 fighter will use only one ozone depleting substance (ODS), Halon 1301. In fact, I think they will work their way out of that before the plane is fully operational. This compares with the C-5 which uses tons of ODS. Weapon systems are so important in environmental planning because when you write a technical order for the F-22, the environmental decisions implicit in that document are going to drive the behavior of the Air Force for decades.

On a related topic, the Air Force has done an outstanding job of preserving and protecting our natural and cultural resources. In fact, if it weren't for a Vandenberg AFB (Calif.) program, the Chumash Indian rock art and other natural and cultural resources on base would be gone today. There would be wall-to-wall condominiums or a theme park out there. We have more than 65 people — biologists and other specialists — working full time on our ranges protecting our natural resources. Endangered species are actually thriving and multiplying on Air Force ranges — the red wolf at Dare County Range in North Carolina has multiplied since we introduced it there a couple of years ago. In fact, if I were an endangered species I would prefer to live on an Air Force base than in most places in the country.

The Air Force environmental program is clearly, in my view, the leader in the federal government. I think it will also stand up against any corporation in this country. But, we have a lot left to do.

Clear air, stormwater and run-off standards are the next big issues to hit and we haven't fully assessed their impact. That's a tribute to Gen. McPeak and the Air Force leadership who understand that our business is more than rockets, missiles and aircraft — it's defending our natural environment as well.

> ***"The Air Force environmental program is clearly, in my view, the leader in the federal government."***

***Dr. Hartzer*: Let's discuss "quality of life" issues. I know that adequate housing for single and married personnel has been one of your priorities. What improvements have been made in this area and what do you foresee?**

Gen. McCarthy: Housing is an important quality of life issue, but not the number one issue. Number one is compensation. I firmly believe that a good pay raise can increase anybody's quality of life.

Housing is also very important. It fits into the overall Air Force priorities on what Secretary [Sheila] Widnall calls the "people first" program. It's important now more than ever, I believe, because our pay has not kept pace with the cost of living and living off base requires more out-of-pocket money. In fact, the average military member pays 22 percent more than he or she receives in BAQ and VHA. At some locations, there are concern about security and social support services. Many families take a lesser quality house on an Air Force base because they feel very comfortable on a base that has a child development center, an elementary school, medical care, and friends and colleagues from the same team. Linked to that is the fact that our TDY rate is higher than it has ever been in peacetime. Having your family in good housing on a base makes you feel more comfortable if you are going to be TDY.

The Air Force has worked very hard to provide quality housing for families and single people — unaccompanied people. We have about 118,000 units in the Air Force that we own or lease. Since 1988, we've replaced or completely renovated 18,000 of them. In the '96 Budget, which Congress is considering, we are going to replace or totally renovate another 2,147 units with a budget of $249 million, which would be, I believe, the second largest housing budget ever. This is in a period when the budget fights are really horrendous in the Pentagon, but the Air Force leadership says we are not going to back off. We are going to continue to invest in quality housing for our families. However, even though this investment program is very good, it is not enough because 60,000 of the 118,000 housing units are still 1950s vintage.

Regarding unaccompanied housing, first of all we need to draw back from the idea that every unaccompanied airman must live on the base. Historically, we thought they all should live on base so in case a war started they'd be ready. That's WWII-era thinking, and times have changed. Today, the airmen we want to live on base are the enlisted people — those in the very, very junior grades who are not as experienced as their seniors and need to be on the base. Remember also that in some rather remote areas, we must provide on-base housing for unaccompanied personnel in more senior ranks because the private sector can't handle it.

Maj. Gen. James E. McCarthy takes a break from his daily workload.

We also have to determine what today's young men and women expect in their living accommodations. The answer is privacy. After a long day of working or being deployed, oftentimes an individual would like to be alone. Our standards today don't allow that for E-4s and below, and we need to change. On January 18, my colleagues in the other services and I presented to the Defense Department Installation Board a new dorm standard that would provide every airman a private room with a walk-in closet, a kitchenette and a shared bath with one other person. All the services agreed to the standard. It has yet to be approved by the Secretary of Defense, but we are working on it.

The dorm budget for '96 is $132 million, the largest since 1989, and will produce about 3,000 rooms. If we stay on that track, we will meet the current dorm requirement in about eight to 10 years.

***Dr. Hartzer*: During your time as the civil engineer, in addition to the downsizing of the force, there have also been base closures and downsizing of the Air Force physical plants. What challenges does this bring to Air Force civil engineering?**

Gen. McCarthy: One of the greatest challenges is that the physical plant has not come down as much as the budget. The budget that cares for the physical plant has decreased faster and farther than the workload driven by the physical plant. The Base Realignment and Closure process was suppose to bring physical plant down as far as it could, but it won't get there for a number of reasons. What we are faced with is a budget that decreased too much too soon and got ahead of the base closure process. We've tried to do some things to offset this, such as pumping up the real property maintenance budget. We were successful in adding $1.4 billion to the Program Objective Memorandum by giving up half of our military construction because it occurred to us and the Air Force leadership that we ought to take care of the facilities we already have before we buy a lot more. Unfortunately though, the MILCON budget later took a hit.

***Dr. Hartzer*: With the most recent base closure announcements—the proposed closure and movement of AFCEE personnel from Brooks (AFB, Texas) to Tyndall (AFB, Fla.), what do you see as possible advantages of co-locating two FOAs at Tyndall (AFB, Fla.)?**

Gen. McCarthy: First of all, it was my recommendation when Brooks was being considered for closure, to move AFCEE to Tyndall instead of Wright-Patterson. The reason I did that is I thought the fundamental mission of AFCEE was more closely related to civil engineering than to any Air Force Materiel Command function. I believed if it went to Wright-Patterson, it would ultimately be combined with the Human Systems Center into a large environmental organization which might not focus on the day-to-day base-level activities of civil engineering. So, I said Tyndall has a good organization called AFCESA and has operating locations of the Wright and Armstrong labs here; I think I'd like to move AFCEE to Tyndall. I think that we can have some efficiencies by co-locating AFCESA and AFCEE and eventually, and I'll leave that to my successor, maybe merge the two organizations at the right time.

Any time two organizations merge, you ought to realize some economies of scale and operational efficiencies, but there's another factor, too. Much of AFCEE's mission is transitory in nature. The Air Force hopes to have most of the hazardous waste sites cleaned-up in the next five to seven years. Because a high percentage of what AFCEE does is cleaning up our active and closing bases, I think some of its manpower will decline as those activities are nearing closure. However, some of their functions such as pollution prevention, design and construction management and environmental compliance, are all major responsibilities of CE organizations and will remain so for a long, long, time. I believe there is potential for some integration of the two organizations. Right now, I am advocating co-location. When the DERA and BRAC clean-up workload goes down, then look into some organizational merging.

***Dr. Hartzer*: Professionalism has always been a core value of civil engineering. This is one of the concepts which was so important to Gen. [Augustus] Minton in the late 1950s and early 1960s. How important are professional registration and membership in professional societies?**

Gen. McCarthy: Professionalism comes in many forms. You can be a professional military person by setting and attaining a high standard of behavior and performance. In relation to the engineering and architectural professions, one defining statement of professionalism is certification and registration which tells the customers and co-workers that you have demonstrated technical competence of your profession at a high standard. I have told our officers that having PE behind your name will not necessarily get you promoted any faster, but it does make a statement to your colleagues and superiors that you have gone the extra mile. As an Air Force officer or civilian employee with a professional registration, you have credentials that should make you a better Air Force officer or civil service person; you ought to be able to do your Air Force job better because you are a better engineer, architect or whatever. It's like advanced training or an advanced degree — it's an enhancement of your technical credentials and capabilities. I will also say that when you leave the Air Force as an engineer or architect — and all of us do leave, eventually — professional certification and registration are incredibly important in the private sector. I often receive calls from firms looking for engineers who are leaving the Air Force and about the

*See **Civil Engineer**, page 50*

AFIT looking for qualified instructors

by Capt. Peter C. Bahm
Air Force Institute of Technology

Have you ever thought about volunteering to be an instructor at The Civil Engineer and Services School at the Air Force Institute of Technology (Wright-Patterson AFB, Ohio)? Whether or not the opportunity to teach immediately sparks your interest, we encourage you to read on.

TCESS offers civil engineer officers an excellent opportunity to broaden their horizons by teaching quality education to others within the civil engineer community.

What benefits can TCESS offer?

❑ Opportunity to teach in a quality environment and interface with people from a variety of CE backgrounds and experiences

❑ Opportunity to research CE issues

❑ Opportunity to be involved with CE community improvements

❑ Professional development opportunities

❑ The challenge of support to civil engineers Air Force wide

What are we looking for in our instructors?

❑ Master's degree or higher in related subject (or bachelor's degree in architecture)

❑ Preferably, a junior Captain with two assignments

❑ Experience and recognized expertise or ability to learn quickly

❑ Good presentation skills

❑ Desire to improve both self and CE career field

An assignment at TCESS offers an excellent career opportunity and allows an officers' knowledge and experience to benefit the entire CE community. If you feel you would make a good instructor, we encourage you to volunteer for TCESS positions as they become available. Several are currently available as of this writing and more will be as current faculty depart for other assignments.

Interested officers should volunteer through Air Force Manpower Personnel Center and contact Capt. Peter Bahm, chairman, Faculty Recruitment Committee, DSN 785-5654, Ext. 3521 or via E-mail: pbahm@afit.af.mil.

Officer initial skills training update

by Maj. John Arin and Ms. Linda McBride
AFIT

In the November/December issue of *The Civil Engineer*, we told you about a forthcoming revision in The Civil Engineer and Services School education program to accommodate engineer career field initial skills training.

The initial skills training objective is to produce mission capable officers and civilians by providing a detailed understanding on planning, managing and executing job requirements.

We are pleased to report that IST is now fully operational. Almost one hundred military and civilians have successfully completed a rigorous eight week (four week for civilians) education and training program. The Air Force Civil Engineer or the Air Force Civil Engineer Support Agency commander have awarded all military students their civil engineer career field badge upon completion of IST.

IST consists of the revised MGT101 Course, Introduction to Base Civil Engineer Organization, and Engineering 485, Combat Engineering. (The sequence will be called simply Management 101, Introduction to Base Civil Engineer Organization, in Fiscal 1996).

During the first two weeks, all students receive the same education: a basic understanding of the structure of the civil engineer objective squadron and other key CE support organizations, as well as basic responsibilities of each flight. During weeks three and four, students work in their assigned flights' specialty class discussing job specific skills needed to perform effectively. The last four weeks of IST (three weeks in the TCESS schoolhouse and one week of Officers Field Education at Tyndall AFB, Fla.) give new CE officers a look at their wartime roles and missions.

There are some unique registration procedures for IST. The big change from the past is Air Force Military Personnel Center assigns the new accessions to an IST class and loads the student information into the Training Management System. The military personnel flight of the new accession provides reporting instructions. Non accessions new to the civil engineer career field and qualified civilians still apply through their unit or major command training manager. Unit- funded seats are also available to those interested and qualified for the two-week flight specific portion and again, applications must be submitted through their unit or MAJCOM training manager.

For officers entering the civil engineer career field after December 31, 1993, completion of IST is a mandatory requirements to upgrade to a fully qualified AFS. In addition, all accessions should attend IST within six months after arrival at their duty stations. Progress has been in reducing the backlog of those needing training while keeping up with the accessions flow. We expect to have only accessions to schedule by Fiscal 1996.

New hazardous materials law

Air Force bases have passed a July 1 deadline to comply with a new law to notify the general public of all hazardous materials stored at their locations.

While compliance with some sections began in 1994, compliance with section 312 begins March 1 and compliance with section 313 begins July 1.

Executive Order 12856 was signed by the president in August 1993 and requires federal agency compliance with provisions of the Pollution Prevention Act of 1990, and the Emergency Planning and Community Right-To-Know Act of 1986.

Even though the executive order only applies to stateside bases — which are the only ones required to report — it states that overseas bases should take the same source reduction steps.

For more information on compliance, people can talk to the local base civil engineering environmental manager. **(AFNS)**

Consolidated CE training in military's future

by SMSgt. Frank Vandevander
HQ AFCESA

There's a new buzz word in the CE community - ITRO.

If you are wondering what this word is ITRO has to do with you, reading this article may provide some answers.

Inter-service Training Review Organization, under auspices of the Military Training Structure Review directed each of the military services' civil engineer functional communities to participate in a Detailed Analysis Group study.

The purpose of the study was to review CE technical training to assess opportunities to consolidate the training presently being conducted by all branches of the armed forces. A key objective of the assessment was aimed at the feasibility of conserving Defense Department resources to the maximum extent possible.

In striving to achieve this objective, the DAG was responsible for improving training effectiveness, maintaining or improving combat readiness and eliminating or reducing infrastructure duplication.

Lt. Col Scott L. Smith, 366th Training Squadron commander, Sheppard AFB, Texas lead the Air Force analysis team on the DAG.

The time and effort expended by the DAG has resulted in recommendations that will consolidate and/or collocate training in the following specialties: Fire protection; heating, ventilating, air conditioning and refrigeration; electrical; utilities; structures; pavement and equipment operations; engineering; and, construction equipment mechanics.

TYPE	*CURRENT LOCATION*	*JOINT TRNG LOCATION*
Equipment Operators	Gulfport, MS Port Hueneme, CA Sheppard AFB, TX Camp LaJuene, NC Fort Leonard Wood, MO	Fort Leonard Wood, MO
Engineers	Gulf Port, MS Port Hueneme, CA Sheppard AFB, TX Fort Leonard Wood, MO	Fort Leonard Wood, MO
Construction Mechanics	Gulfport, MS Port Hueneme, CA Sheppard AFB, TX Camp LaJuene, NC Fort Leonard Wood, MO	Port Hueneme, CA Fort Leonard Wood, MO
Structures (Carpenters)	Gulfport, MS Port Hueneme, CA Sheppard AFB, TX Camp LaJuene, NC Fort Leonard Wood, MO	Gulfport, MS
Plumbers	Gulfport, MS Port Hueneme, CA Sheppard AFB, TX Camp LaJuene, NC Fort Leonard Wood, MO	Sheppard AFB, TX
HVAC/Refrigeration	Gulfport, MS Port Hueneme, CA Sheppard AFB, TX Camp LaJuene, NC Aberdeen Proving Grounds, MD	Sheppard AFB, TX Aberdeen Proving Grounds, MD
Electrician	Gulfport, MS Port Hueneme, CA Sheppard AFB, TX Camp LaJuene, NC Fort Leonard Wood, MO	Sheppard AFB, TX Camp LeJuene, NC Fort Leonard Wood, MO
Firefighter	Goodfellow AFB, TX Memphis, TN	Goodfellow AFB, TX

Training for these specialties will be spread across seven installations, where training and capacity already exists; Fort Leonard Wood, Mo.; Aberdeen Proving Ground, Md.; Camp Lejeune, N.C.; Sheppard AFB, Texas; Goodfellow AFB, Texas; Gulfport, Miss. and Port Hueneme, Calif.

The target date for completion of the vast majority of training changes is Oct. 1, 1995.

Instructor named educator, manager of year

Capt. Michael D. Heard, a civil engineer instructor in the Engineering Management Department of the Civil Engineer and Services School, Air Force Institute of Technology, at Wright-Patterson AFB, Ohio, was selected as the Air Force's Financial Manager/ Comptroller Educator of the Year for 1994. Heard earned this award based on his leadership, officership and professional expertise for his work in and out of the classroom. Heard is the director for the Resources Management Applications Course, Financial Management Applications and the resources specialty session of Initial Skills Training (Introduction to Base Civil Engineer Course).

In addition, he was the key player in the program development, budget formulation, justification and submission of the $36 million AFIT budget for 1995. Heard also provided technical guidance in financial management to the contractor developing the Electronic Performance Support System, which is a form of computer-based training that generates real-time learning and performance information.

ROST: Big savings to Air Force

Continued from page 40

(ARPA). The proposal submitted by Armstrong Laboratory, Unisys Corporation, North Dakota State University, and Dakota Technologies is to produce a commercial version of the tunable laser spectrometer that is simple enough for technicians to use.

The partnership's proposal was successful and received funding of $1.6 million from the TRP ARPA. These funds are combined with matching funds from the industry partners to develop the commercial product now known as the Rapid Optical Screening Tool. ROST is able to measure petroleum levels in soils down to parts per million. Best of all, the technology requires no drilling of wells and minimizes costly laboratory analysis of samples.

ROST has been used successfully at more than 30 fuel-contaminated sites in the U.S. and in Europe. A January demonstration of the technology at Kelly AFB, Texas was filmed by Air Force News and the Discovery Channel, the latter for future commercial broadcast.

Bruce Nielsen (left) receives plaque from Tina McKinley (right) Federal Laboratory Consortium Chairperson, while Dr. Chuck Chatlynne (center) Air Force Scientific and Technical Information Program Manager looks on.

Not content with this achievement, Nielsen and another private partnership applied for a second TRP grant to further develop the Environmental Systems Management, Analysis and Reporting neTwork (E-SMART), a sophisticated data acquisition system to support "smart" sensors and actuators with modeling and visualization software for environmental management of Air Force and industrial sites. This grant, awarded within a year of the other, was for $2.7 million. This time the partners were Armstrong Laboratory, General Atomics, ISCO, SEACOR, Georgia Tech Research Center and Photonic Sensor Systems.

Nielsen is an unrelenting advocate of pushing existing technology to its limits as long as it can save resources and make the job easier. He said, "It's refreshing to have industry and government working together for mutual benefit, especially when the real beneficiaries are the American taxpayers and the economy. Industry's willingness to invest in our dual-use technologies proves that our research and development programs are valuable and that we are meeting environmental needs. Commercializing these technologies saves the government further development dollars and makes the technology available to the whole world. Industry is able to get the technology to the customer faster so that the cost savings can be applied sooner."

Col. Neil Lamb, Environics Director, put Nielsen's achievement and the FLC award in perspective. He said, "His ROST technology alone is projected to save the Air Force over $100 million in characterization costs. The jury is still out on the other technologies he has managed, but I suspect the results may be even more spectacular, since monitoring is so costly, as well as being a long-term liability."

Mail Box

The Civil Engineer allows readers to comment on the content of articles printed in this publication. There is no set limit on the word length of articles or responses, but please include your name, rank, address and duty phone number.

We want your ideas, your stories (especially those of a technical nature) to share with civil engineering colleagues. We also want your photographs and your comments — good and bad. We will make an attempt to print all the responses received.

Correspondence should be sent to: *The Civil Engineer*, HQ AFCESA/PC, 139 Barnes Drive, Suite 1, Tyndall AFB, Fla. 32403-5301, or faxed to (904) 283-6499 or DSN 523-6499.

WEARING THE EOD BADGE

Your article on the new civil engineer badge was excellent, however, the instructions for wear of the Explosive Ordnance Disposal (EOD) badge was in error. In reality, the EOD badge can be worn on any authorized uniform and should be worn in conjunction with the civil engineer badge if assigned to a civil engineer activity. If the individual is assigned to an EOD position, then the EOD badge is worn above the civil engineer badge. If the individual is assigned to a non-EOD position, then the civil engineer badge is worn above the EOD badge. This alignment simply places the badge that more closely represents the individuals current duty assignment in the position of prominence. Hope this helps answer all those questions we've received from the field.

***CMSgt. John J. Glover,** AFCESA*

Doctrine: Engineer mission tied to equipment

Continued from page 13

capabilities, putting RED HORSE in great demand by all armed services. One of the first issues addressed when RED HORSE was set to deploy to Saudi Arabia was operational control. Lt. Gen. Charles A. Horner, USCENTAF commander, made it clear that they would report to him through the USCENTAF/DE. Although they worked on projects for the Army and Marines, RED HORSE remained within Air Force channels.

Throughout history, quality people have been the engineer's most valuable asset.

Another key precept relates to the partnership that engineers develop with host nation and contractor personnel. Engineers should develop proactive host-tenant agreements, and network with contractors to ensure effective engineer operations. Contractor personnel have been intimately involved with engineering activities since the Korean War when Vinnell Corp. personnel were hired to train SCARWAF engineers on heavy equipment and ended up doing significant amounts of work on projects themselves.

PLANNING CONSIDERATIONS AND SUPPORT REQUIREMENTS

Accurate and current engineering information can be critical to the success of any mission. Data on airfield pavements, facilities, utilities, threat, possible host nation support and water influence the composition of engineer teams, tools, support equipment and supplies taken on a deployment. The availability of host nation commercial power at a site may mean fewer power production personnel would be required than a base run solely from portable generators.

Effective on- and off-base communications are crucial to engineering operations, especially at deployed locations. Information that used to take days or weeks to transmit and receive, now can be done in seconds. A modem line between USCENTAF/DE in Riyadh and the Battle Staff at Langley enabled the staffs to transfer large amounts of information instantly and allowed the staff to proactively support the people in theater. At the base level, communications was often cited as the number one limiting factor in the early days of the deployment. Teams either deployed with no radios, insufficient numbers of radios, inadequate radios or equipment that used the same frequency as the host nation. Firefighters found they were carrying several radios so they could talk to everyone on base.

The engineer mission depends on the availability of materiel and equipment. Engineers must be active members of the planning process to articulate their requirements and ensure they are included in logistics support plans. Equipment should arrive when and where needed to permit engineers to fulfill their mission.Prepositioning of heavy bare-base assets and heavy equipment and vehicles greatly reduces transportation time and expense. However, prepositioned equipment may not be in operating condition when it arrives on site, so engineers should be prepared to confront that possibility.

TRAINING AND PEOPLE

A key insight throughout history has been that quality people are the engineer's most valuable asset. Whether on the coast of Normandy, the mountains of Korea, the jungles of Southeast Asia, the desert of Saudi Arabia, or the villages of Somalia, engineers have overcome staggering shortages of equipment, supplies or manpower to accomplish some amazing feats. The secret is realistic training in the engineer's three roles as warriors, professionals and ambassadors. It should be conducted on three levels—individual skills development, unit training, and integrated training and exercises.

YOUR DUTY

Part of the professional responsibility of every civil engineer is to be familiar with this doctrine and apply it in his or her daily duties. This article is merely a brief overview of the document; you need to read it for yourself. To increase the awareness of the principles contained in our doctrine, a video will soon be available that will further explore its contents.

Although AFDD 42 is only a 10-page document, do not be fooled by the brevity. Every word was carefully chosen to provide accurate and clear guidance in all aspects of the engineer mission. Each doctrinal precept has intricate nuances and implications that should be explored, discussed and analyzed. The insights gained during 50 years of engineering experience are summarized in the document. Engineers should read the doctrine document and begin an on-going, open doctrinal dialogue on its content. This publication is the ideal place for that discussion to be carried out. Sit down at your computer, submit an article and tell other engineers what you think. CE

Propane: Facility gives base fuel options

Continued from Page 21

widely used as it permits truck transport delivery at a lower cost from the supplier, with 50 percent capacity in the storage tank.

The actual size of the storage facility depends upon the demand of the process and the availability of a propane supply. A standby system should have a minimum of one week of storage.

For example: An Air Force base has a process operating 10 hours per day, at an average usage of 18 million BTU per hour. The propane required will be 1,980 gallons per day. A 30,000 gallon storage tank will provide a 14-day supply. (*A 30,000 gallon storage tank can only be filled to 88% capacity at 60°F.*).

The storage tanks will require the following accessories:

Fill port or fill opening valve
Liquid outlet port or process opening valve
Vapor area opening valve;
Pressure gauge;
Liquid level gauge;
Thermometer;
Pressure relief valves;
Excess flow valves;
Back pressure check valves;
Rotometer

Storage tanks can be installed underground. Underground tanks will have additional requirements consisting of the following:

Man-way hatch;
Cathodic protection;
Tar coating;
Concrete ballast

Propane Pumps

The propane must be delivered under pressure to the mixing station. In most instances, the vapor pressure of the propane in the storage tanks is adequate to deliver the propane to the mixing station at sufficient pressure. However, the vapor pressure in the tank is dependent upon the volume and temperature of the propane. As the propane temperature drops and/or the tank empties the vapor pressure in the tank may not be adequate to deliver the propane to the mixing station at sufficient pressure. During these conditions liquid propane pumps are used to provide sufficient propane flow and pressure at the mixing station. Propane pumps are either of the positive displacement, or turbine type. (See Figure 3.)

Vaporizers

In some small applications, vaporization can take place in the storage tank and vapor can be taken directly from the tank. The rate of vaporization is a direct function of the heat transfer through the tank wall to the liquid. A 30,000 gallon storage tank will vaporize only 4.5 million BTU per hour of liquid in a tank half full on a 0°F day, at five psig. The smaller the tank, the less vaporization will take place; an 1,850 gallon tank will vaporize 650,000 BTU per hour at the same conditions.

In most standby systems, a vaporizer is utilized to convert liquid propane to gaseous propane, since vaporization produces a chilling effect and heat must be added to stabilize the process. The vaporizer may be *steam-fired, direct gas-fired, direct-fired water-bath,* or *electrically heated.* The choice depends on the availability of steam or electricity, physical space limitations, demand requirements and the quality required of the air-gas mix. The direct fired water-bath vaporizer is the most likely choice for a plant of sufficient capacity to serve an Air Force installation.

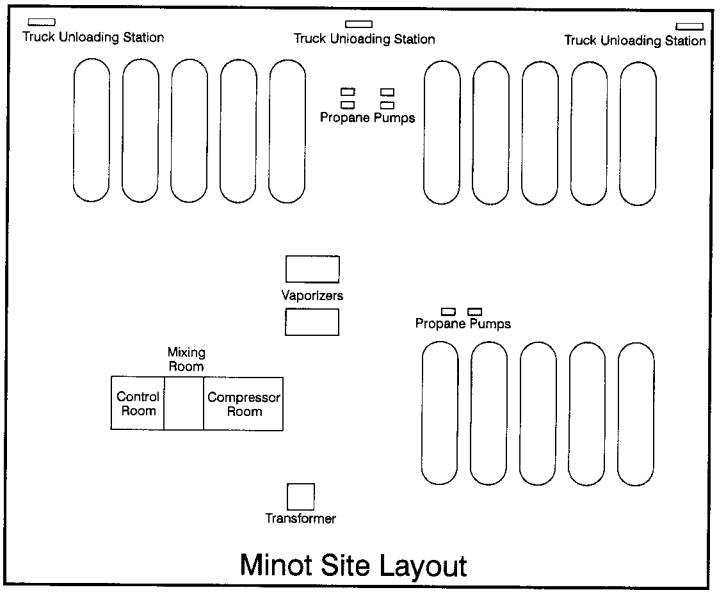


Figure 4.

The *steam-fired* unit utilizes a steam coil to vaporize the propane. This unit is relatively small in size and can be installed adjacent to the plant. The capacities range up to 400 million BTU per hour. (See Figure 4.)

Direct-fired vaporizers use a burner to heat a chamber containing propane similar to a pot of boiling water on a range. These units have a maximum capacity of approximately seven million BTU per hour and are manifolded where greater capacities are required. There is a large variation in propane vapor temperature from a direct-fired unit. This will vary the specific gravity of the propane, which will vary the BTU content of the propane-air mix. These vaporizers must be located 25 to 75 feet from a building or storage tank.

Direct-fired water-bath vaporizers use a burner system to heat a solution of ethylene-glycol, which indirectly

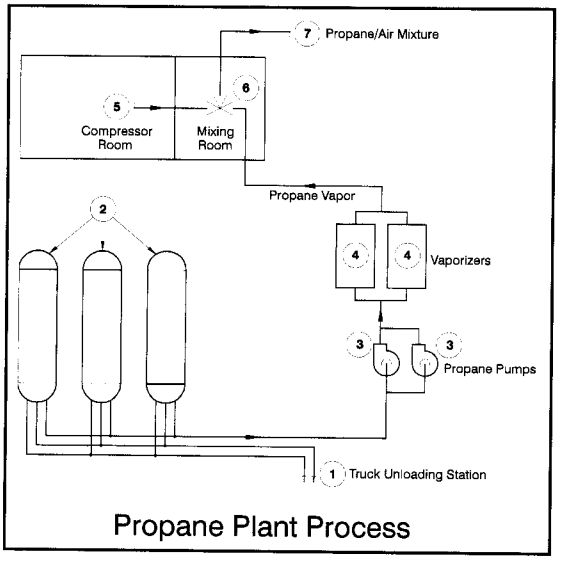


Figure 3.

heats a coil containing the propane. The output temperature of the vapor is more consistent than direct-fired systems. The water bath models range in size from seven million BTU/hr to 900 million BTUper hour in one unit. The location requirements are similar to that of a direct-fired unit, 25 to 75 feet from a building or storage tank.

Electrically heated vaporizers are generally small in size and capacity, under three million BTU per hour. They are used where limited space is available or in areas which may be hazardous. They are built to Class I, Group D electrical specifications (explosion-proof), and can be located next to buildings.

Mixing Stations

Propane-air mixing plants can be categorized into three types by the means of achieving the propane-air mixing. These categories are venturi type, blower-mixer type, and high pressure mixing type.

Venturi-type mixing stations delivers propane under pressure through a venturi nozzle and air is inspirited through the venturi and mixed with the propane. The resultant mix is generally delivered to a surge tank, as the limited turndown of the venturi requires it to be operated on an off\on cycle. The process load operates from the surge tank and the venturi operates to maintain the tank pressure. The number of venturis, their individual capacity, and the size of the surge tank will establish the maximum capacity available from the system. The range of sizes goes from up to four million BTU per hour with one venturi, up to 200 million BTU per hour with eight or more venturis, with output pressure from six to ten psig, depending on a particular manufacturer.

Blower-mixer type mixing stations draw air and propane into the inlet of the fan, mixes it, and delivers it to the system at an increased pressure of six inches wc to two psig. The turndown of this type system is generally eight to one.

High-pressure type mixing stations delivers propane to a mixing chamber under pressure. The air is delivered to the same mixing chamber from a high pressure blower or air compressor. The mix is then fed to the piping system. The propane is usually pumped to the vaporizer to provide the necessary pressure for the operation. Output pressure can range to 150 psig. This is the most common type of system at larger installations like an Air Force base, due to the higher delivery pressure usually required by the bases.

Feasibility Analysis

The feasibility analysis for a propane-air plant involves quantifying the potential savings and the cost to construct and operate the plant. Savings result from the lower cost of interruptible gas and the avoidance of demand charges. A demand charge is usually associated with firm gas only and can be based either on a contractually specified maximum daily quantity or on a maximum usage established during a set time. A demand charge is usually assessed on a monthly basis and provides the utility with funds to make service available. If the cost of natural gas includes a separate component for transportation charges, calculations must account for the difference in interruptible and firm transportation rates. Several cases should be considered with different levels of firm and interruptible service with appropriately sized propane-air plants in order to determine the point of optimum of savings. Savings are determined by comparing the existing total cost of natural gas service, including any demand or transportation charges, to the total proposed costs.

For further information, contact Mr. Fred Beason, AFCESA/CESE, DSN 523-6361 or Commercial 904-283-6361.

Fire: *Aerial assaults possible with helicopter missions*

Continued from Page 39

"to get down and dirty" instead of the slow, easy-paced routine of hauling heavy field equipment.

"We won't know how it all works until we hit our first fire," said SSgt. Wade Koch, flight engineer. He indicated that the military aircrews received training on aerial wildland fire fighting procedures from California Department of Forestry aviators. Joint agreements with local departments and the U.S. Forest Service may put the Vandenberg water-dropping choppers in service to support non-military emergencies. "The helicopters don't put out fires; we're here for support. One of the advantages to the overall effort will be the use of our forward-looking infrared system that is able to pick out hot spots that might other wise go undetected."

"The helicopters can get into areas that ground personnel, trucks or aircraft can't," said Marko, who believes that Vandenberg is the only Air Force fire fighting unit with this capability.

The helicopter squadron also functions as a Helicopter Rescue Support Team called Rescue 76. According to Koch, 12 firefighters are six months into a three day-a-week aerial training program on rescue support which emphasizes the use of fast-rope rappelling, rope ladder operations and litter or rescue basket manuevers. Future training may also include swift-water rescue.

"Firefighters are our best option for recovering people who are downed in areas that are inaccessible by means of traditional ground support because of their experience in rescue and the training that they've had with ropes," said Koch. "The firefighters are also more likely than any other agency to have people trained to work in mountainous terrain. We would like to move into the area of having some firefighters who are open-ocean swim qualified to help us out but, that depends on how far the program developes and the extent of the fire department's involvement."

To date, Hurst Rescue 76 has received three real-world emergencies calls, "only to find that the victims had been recovered either before the crew arrived or took off. But we did run through the system and it went as smooth as silk," said Koch.

At the nerve center of the fire fighting operation is the alarm room where SrA. Ronald Gonzales is on a one-year tour as a dispatcher. He handles all emergency calls to the base, routing communications to the appropriate agency — fire, police or hospital. When a call comes into the alarm room from one of the 4,543 structures on base — 2,076 of which are housing units — the computer displays the structure type and occupancy, the interior of the building, its location and a route to the facility from one of the base's five fire stations. A back-up computer-based telephone alert and dispatch communications system, which will expand current radio and cellular alternatives, is planned for installation at another base fire station currently under construction.

"You have to keep track of all the people in the department at all times," said

*See **Firefighter**, Page 51*

Civil Engineer: New thinking to offset reductions

Continued from Page 43
second question they ask is, "Is he or she registered?" It's nothing more than a business requirement because these firms are looking to do business with clients who expect the best qualified engineers.

Shifting a little to professional organizations, I believe being a member of a professional association is very important. There are a number of them, such as the Air Force Association, the Society of American Military Engineers — which I view as a parent organization for military engineers — the American Institute of Architects, American Society of Civil Engineers and so forth. I strongly urge our men and women to join and to participate in these organizations. It is good for them and it is good for the Air Force. They allow the military member to learn about the private sector and what it can provide the Air Force. It also teaches the private sector more about the Air Force. With the advent of the all-volunteer force in 1973, the percentage of Americans, including members of Congress, who have served in the military is declining. There are people who don't even understand why we have a military today with the Cold War over. This is another opportunity to inform the public about the armed forces, particularly the armed forces engineer. I would say for any young person in our Air Force CE business, they ought to endeavor to become registered and join a professional society and give their time and effort. It will pay off for them and our Air Force.

Dr. Hartzer: ***The Civil Engineer* publication and its predecessors, particularly the *Engineering and Services Quarterly*, have always played an important part in the development of professionalism in civil engineering. What do you see as the role for a publication such as this for Air Force civil engineers?**

Gen. McCarthy: Communication is incredibly important. In the past, our publication took hits and was even eliminated. But we brought it back first as a newsletter and now we are making great improvements. I think it has the potential to become a very powerful communication device to inform all CE people in the Air Force about our heritage, about our doctrine, about some of the engineering lessons from previous decades and wars as basic guidance on how to move forward in the future. It is a device for communicating technical information and showcasing our heroes, our people who have made some achievement. It also has some newsletter value. We are all interested in hearing about what is happening here and there, who is moving, when the WIMS is going to change. I believe it is much more than a newspaper. It ought to convey the spirit, values and traditions of Air Force civil engineers as well as current information. I would like to see it on CD-ROM one of these days or on the Internet, so that anyone in the CE shops with a computer terminal can dial into it. I think we ought to shoot for that.

Dr. Hartzer: **What future challenges do you see for Air Force civil engineers?**

Gen. McCarthy: The immediate problem for the next four or five years is the looming civilian workforce reduction. The government decided that we were going to reduce the number of federal employees by 250,000 and the Air Force's share is about 27,000. Part of that will be solved by BRAC, but not enough of it. So, how do we deal with that? We have dealt with different reductions so far and are still doing a good job. But if this one goes through, we will have to do something fundamentally different. We have built some models on how we can restructure and get the military out of about eight more bases than they are today. You could then do your A-76 business to see if they will stay civil service or privatize. This isn't just a matter of economics. This is a matter of having fewer civil service people. It isn't that we can't afford to pay them, it is simply that we need fewer faces. So, how do you do that? CE squadrons are big employers of civil service people. So, if job reductions are done on a fair-share basis, the CE squadron gets hit hardest. It is going to require some dramatic new thinking, like taking 400 military out of AFMC and AETC and putting them in other commands and then doing A-76 on those bases.

> ***"We have to know when to be Air Force people first and CE people second."***

Dr. Hartzer: **What have you personally enjoyed most about being The Air Force Civil Engineer?**

Gen. McCarthy: I believe what I have enjoyed most, and this may sound corny or trite, but it is working with some superb people. Our staff in Washington (D.C.) and at Tyndall and Brooks are highly-motivated, competent people. I often talk with former Air Force people who are now in the private sector who tell me they would put our people up against theirs any day of the week. That makes me feel real good and makes it fun to go to work every day.

Secondly, although everybody works for somebody, The Air Force Civil Engineer does have some degree of autonomy, in terms of shaping the future and the budget process. You have a lot more authority to influence that than you think. You have a lot of opportunity and a surprising amount of authority to shape our organizations, training, and readiness programs. What I have enjoyed most is that there aren't too many impediments, other than your own limitations, on what you can do. There are no excuses.

Dr. Hartzer: **Is there anything else that you would like to talk about?**

Gen. McCarthy: I think our Air Force civil engineer people need to continue doing what they do so well. We also must always remember that we are, as Gen. Fogleman says, "a team within a team." The CE squadron is a team within the wing team; my office is a team within the Air Staff team. Sometimes what is great for civil engineering is not always great for the Air Force. We have to know when to be Air Force people first and CE people second. I believe we civil engineers do that very, very well. We understand that we support the flying mission. The flying mission comes first. I have been very proud of how our people react and avoid the stovepipe, union mentality of "if it isn't good for civil engineering, then it is a bad idea." We must continue that in the future because it is going to become more and more important to understand that we are Air Force people first and CE people second. That must override all of our considerations as we do business.

My other comment would be that we

need to continue to focus on our CE squadrons. When I came into my current position, I wrote down my priorities. Number one was my boss. I serve at the pleasure of Gen. Fogleman and before him Gen. McPeak. My responsibility is to make sure the person in that position is served properly and responsibly. My second priority is recognizing that our most valued assets are provided at and by the CE squadron personnel. All of the things we do at the Air Staff, at AFCESA, at AFCEE, at the major command CE staffs, must be focused towards making sure that the men and women in the squadrons can do their jobs well. Training is part of that, equipping them with modern data automation systems is part of that, getting them money is part of that, getting them better technical capabilities is part of that, taking care of people is part of that. We CE leaders must learn how to recognize our people even better than we do today. We must learn leadership and commandership skills even better than we do today. Ultimately, the effectiveness of that CE squadron depends on the leadership that is provided. Our CE squadron commanders get promoted at a faster rate than almost any other career field. I am very proud of that. But as we move into the rest of this decade, never forget that the product of my work, or the MAJCOMs' work, or the FOAs' is manifested in the performance of CE squadrons or groups. If we forget that, and we begin to think that our staffs exist for their own purpose, then we will not be serving our Air Force properly.

Firefighter: Job dangers come with turf commitment

Continued from Page 49

Gonzales, who'll return to the "floor" - the station - as a firefighter once his dispatch tour is completed in January. "This is a very important job because the dispatcher has to get all the information to the crews. You learn a lot in here about yourself. You're constantly in touch with the public. It can be a stressful job because you're helping others with their misfortune."

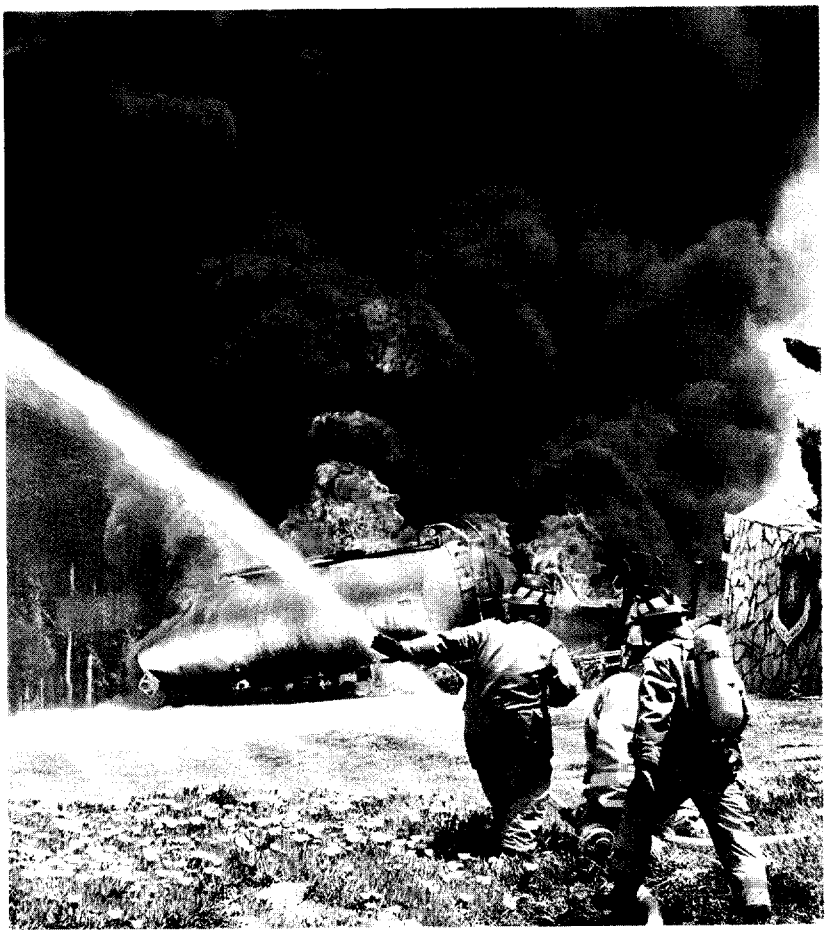
"It's makes the job less complicated by having someone in the alarm room who knows what we're talking about when we send a radio message," said Marko, over a lunchtime sandwich.

Suddenly, a three-pitched alarm blares from the radio hitched to his waist band, followed by Markos' call sign and directions to proceed to the scene of a reported car fire. Vacating the on-base burger palace, a perfectly good pile of french fries are dispatched, via forced entry, into the "thank you" flap of a garbage receptacle.

Back at the station, the family-type discussions continue. R.D. Mashburn, a three-year blue-suit firefighter, is following in the career footsteps of his father, 34 years a firefighter in Sacramento, Calif.

"This is the kind of career where you have to get the work done, even when circumstances are dangerous," he said. "The passion is helping people in their time of need. You can't let volatile circumstances create a fear that will prevent you from doing your job when people are counting on you. If you do, you're probably in the wrong line of work."

Down the line, however, firefighters agreed that the one situation which is a constant source of work-related agony is an on-scene emergency where a child is involved.



Firefighters battle flames from an overturned fuel truck at Vandenberg's front gate.

"It's tough to deal with because a child is so precious and always so innocent," said Silva, recalling having to administer CPR to a baby trapped in a car seat of a vehicle. "The mother was driving too fast and had wrapped the car around a telephone pole. When we finally got the baby free, the child was wearing pajamas and you could smell the baby powder . . . "

Before he could finish the story, another alarm sounded.

Disaster preparedness sets for merger

by TSgt Steve Reed
HQ AFCESA

Disaster preparedness professionals are known to many as chemical warfare instructors. In actuality, few jobs provide as much working variety as Readiness.

After November 1, 1995, the Readiness Flight, which currently contains two jobs -- Disaster Preparedness (3E9X1) and Force Managers (3E6X1) -- will consist of one Air Force speciality -- Readiness (3E9X1). Personnel currently assigned to DP jobs have two career

A disaster preparedness airman at work.

field options: 1) remain attached to their flights as DP specialists where their duties will expand to include "traditional" Prime BEEF tasking, or 2) personnel currently assigned in force manager or "Triple Nickel" job slots (3E9X1) will have to decide whether to remain in these slots and become attached to an operations flight or choose the DP option. Personnel in force manager job slots who don't make a career-field decision will be randomly selected by military personnel officials for assignment to either job field before the end of summer 1995.

The intent of this article is to provide workplace insights for those with a choice of Readiness as a career-field option.

The most immediate areas associated with the field are camouflage, concealment and deception, expedient beddown, nuclear, biological and chemical defense, shelter operations and contamination control. All these warfare functions require a working concept of the base and mission, including mobility, transportation and logistics. Knowing or at least being exposed to the "big picture" is an intangible, but interesting aspect of this job.

Natural disasters and military support to civil authorities is another aspect of the job. How varied can that be? Air Force people have shoveled volcano ash, cleaned-up after hurricanes or tornadoes, put out wildfires, and sandbagged rivers during floods. What is the readiness role? It is certainly not to stop Hurricane Andrew or the Northridge Earthquake. However, you can save lives by preparing and educating folks about the hazards and protective actions to take. Readiness personnel might deploy unit resources, help with base or Red Cross shelter operations, teach contingency planning to unit representatives or orientation courses to base newcomers.

Major accident emergency response is a third primary area. The fire department, security police and medics are ordinarily initial responders. Examples include the Pope AFB N.C. aircraft incident, Ramstein AB, Germany Airshow accident, hazardous materials spills, fires and disasters like the Oklahoma City bombing. Readiness personnel will, however, assist the on-scene commander, orchestrating command and control operations. Readiness is chartered as a focal point for emergency planning, including contingency and hazardous spill response planning. This active-response role includes dispatching resources, detecting and surveying radiological contamination, applying the latest automation techniques for hazardous analysis, evacuation zones, emergency reporting, computer mapping graphics and coordinating with local, state and federal officials.

Mobility, another major portion of the new Readiness AFS provides support for the unit mission. Whether deploying an entire CE team or sending a small group of folks, efficient mobility operations are vital. There is more to operations besides having shot records up-to-date. Sourcing, training, equipping and processing mobility personnel, while at the same time monitoring Status of Resources and Training Systems (SORTS), requires exceptional organizational skills.

Prime BEEF management encompasses all functions of CE personnel. From rapid runway repair to base denial, it is readiness personnel's responsibility to ensure CE has the resources and training to operate during contingencies. A responsibility of being a manager includes assigning people to teams and obtaining equipment and tools for those teams. You would maintain team lists and help ensure each individuals' administrative matters were current, such as shot records and wills. Whether an individual is in readiness or disaster preparedness -- Prime BEEF or force management -- squadron and base-level goals are the same; preparing and executing plans to help save lives, minimizing damage during a contingency and restoring base capabilities to contiue the mission.

Readiness personnel will not normally build things with a hammer, launch aircraft, or create a lot of tangibles, because the intangible for the readiness job is knowledge. "Survival Through Knowledge" is the guiding career-field manaual and is the only thing, other than luck, to help folks survive in a disaster or contingency situation. CE

Agency product available to civil engineers

The Air Force Civil Engineer Support Agency A-GRAM Index will be included in every issue of *The Civil Engineer*.

A-GRAMs are single-page descriptions of management and technical "tools" which will be of assistance to BCEs.

The attached A-GRAM Index covers all items that have been produced and distributed through July 1995.

Individuals requesting information or previously published A-GRAMs should first contact their BCE or major command civil engineer offices for distribution; or AFCESA Professional Communications staff, DSN 523-6264, Commercial (904) 283-6264. The FAX is DSN 523-6499.

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Civil engineer chosen as outstanding airman

by Larry Belcher
Tinker AFB Public Affairs

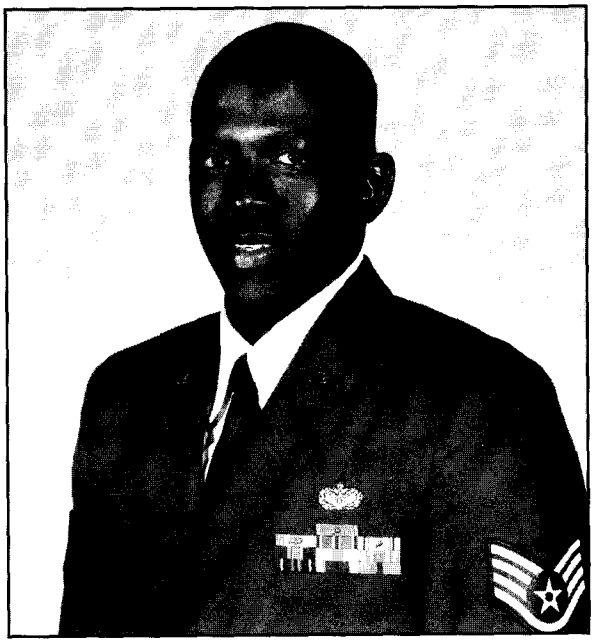
TSgt. Frederick W. Green, a structure worker assigned to the 772nd Civil Engineer Squadron, Tinker AFB, Okla., was selected as one of the Air Force's 12 Outstanding Airmen for 1994.

Three straight years the non-commissioned officer of the year of the 72nd Civil Engineer Group, Green lives by a simple philosophy: "Life is too short to cry about it when things don't go your way," he said. "From day one in my career, I realized that this was an opportunity to give the best effort possible to toward becoming a better airman, a better person, a better husband, a better man."

The lines of people who congratulated Green included senior base officials and civil engineering supervisors.

"TSgt. Green is one of the people who make Tinker so great. He's a wonderful NCO and a great example of how hard people work here," said Installation Commander Maj. Gen. Kenneth E. Eickmann.

Green, who represented the Air Force Materiel Command in the outstanding airmen competition a year ago, is 3-year volunteer worker with LIFE (Life for the Frail and Elderly), an Oklahoma City program that offers free services to the city's senior citizens who need help at their homes with plumbing, carpentry, painting, gardening and the like, but who may not be physically able to do the work themselves.



TSgt. (then SSgt.) Frederick W. Green

Representing the 6,000-person Tinker enlisted community in the competition Green, who was the Tinker AFB, NCO of the year in 1993 and 1994, has humbly accepted the praise that goes with attaining an Air Force-wide honor.

"Fred is the same humble person I met when he first came to our organization. He's not the kind of person to let this go to his head. He gives credit to those around him," said 72nd Civil Engineer Group Commander Col. Robert L. Bartlow.

Green said that the greatest benefit that has come from meeting 25 boards in his short seven-year career is that it has taught him how to study. He holds two associates degrees, and is currently 22 credit hours away from the a bachelor's degree that he expects to complete in March.

"The Air Force has given you the books and opportunity to study," Green said, who is also a member of the base's honor guard. "The program is laid out — study the books and you'll get promoted and you'll learn your job."

"Anyone who has known him for 10 minutes realizes he is a wonderful person as well as a wonderful NCO. His is truly an exceptional guy," said Col. Randy Mills, 72nd Air Base Wing commander.

"This honor was breath taking," said Green. "Looking back, this is one of the greatest surprises of my life."

Those who work closest with Green, his squadron commander and group first sergeant, agreed with the Air Force selection.

"Fred is one example where the Air Force made the right choice," said Maj. Adrian Upshur, 772nd CES commander. "I guarantee you. If you go back into our organization and randomly ask about (TSgt.) Green, everyone will tell you they aren't surprised. They know he's the guy with the ultimate standards."

"He is very versatile. No matter what job you give him, he's going to take it with both hands and run with it," said 72nd CEG 1st Sgt. MSgt. Michael L. Cook.

"We've all learned from Fred. The real beneficiaries are the young people here. Those who have him as a role model and can see his dedication, regiment, discipline and approach. He will tell everyone there is no secret to his success; it's hard work and application. For me, it's a once-in-a-lifetime opportunity just to be associated with a man of his caliber. He's a super young man," said Bartlow.

"I didn't win this award by myself," Green said. "My supervisor, first sergeant, commander and Fabor Orosco, a civilian worker, were especially instrumental in helping me understand and apply time management. Of course, the support comes from my wife, Cheryl, and 3-year-old daughter, Symone."

Although his selection was not a surprise to Tinker officials, for Green, the news came unexpectedly.

"I was called away from the firing range in the middle of a qualifying round. They said I 'had to brief (Col.) Bartlow on my Savings Bond program progress,'" said Green. "By the time I arrived, the general and all the colonels were in (Col.) Bartlow's office and they gave me the news."

And now that he's received news that he's one of the Air Force's top airman, what does Green have planned as an encore?

"As soon as I finish my bachelor's degree, I'm going to open my books and start studying for master. Of course, I won't go overboard to the point of having a heart attack. It's just that I have to keep it going. The Air Force is counting on us all."

(TSgt. Andra Higgs contributed to this article)

CE People

The Air Force Civil Engineer **Maj. Gen. James E. McCarthy** retired July 21, 1995. His replacement, **Maj. Gen. Eugene A. Lupia** moved from HQ AMC/CE, Scott AFB, Ill., to HQ USAF/CE, Washington, D.C.; **Brig. Gen. Robert J. Courter** moved from HQ AFMC/CE, Wright-Patterson AFB, Ohio, to become 37th TRW/CC, Lackland AFB, Texas; **Brig Gen. Philip G. Stowell** left HQ PACAF/CE, Hickam AFB, Hawaii, and moved to HQ AMC/CE at Scott; and, **Brig. Gen. Todd I. Stewart**, formerly HQ AETC/CE, Randolph AFB, Texas is now HQ AFMC/CE at Wright Patterson. **Col. Richard M. Hanes** moved from AFIT/CE to AFMC/CEO, Wright-Patterson AFB, Ohio. His replacement, **Col. James N. Vernon** moved from USAFE/CE, Ramstein AB, GE. **Col. Dean L. Fox** is the new USAFE/CE, coming from HQ USAF/CEV. **Col. Peter K. Kloeber** became the AFCESA commander in May when **Col. Paul W. Hains III** retired. AFCEE commander **Col. Thomas W. Gorges** retired from active duty in June. **Col. Charles G. Rhode**, USAFA/CE, retired and was replaced by **Col Garry W. Earls,** the former AMC/CEP.

A team from the **416th Civil Engineer Squadron**, Griffiss AFB, N.Y., were presented with the **Col. Bernt Balchen Award** for outstanding snow removal for 1994. Sponsored by the American Association of Airport Executives, the award is presented to the **outstanding snow removal team** in four commercial airport categories and to a military unit. Runner up for the military award was the 92nd CES, Fairchild AFB, Wash.

Utilizing a **"pharmacy concept"** to manage the more than 4,000 chemicals that are utilized in more than 1,000 industrial shops helped Kelly AFB, Texas win the Defense Department's Pollution Prevention Award for 1994. Among the base's accomplishments was the **reduction in the use of ozone-depleting substances** by more than 70,000 pounds and **cutting water consumption** by eight million gallons last year. **Bob Chabot** is the chief of Kelly's Pollution Prevention Division.

The Air Force **Gen. Thomas D. White Environmental Quality Award winners for 1994** are: Warner Robins Air Logistics Center, Robins AFB, Ga., best environmental program; 12th Space Warning Squadron, Thule AB, Greenland, best overseas environmental quality program; Warner Robins ALC, natural/cultural resource management; 354th Fighter Wing, Eielson AFB, Alaska, restoration; 509th Bomb Wing, Whiteman AFB, Mo., compliance; San Antonio ALC, Kelly AFB, Texas, pollution prevention (industrial); 90th Missile Wing, F.E. Warren AFB, Wyo., pollution prevention (non-industrial); 45th Space Wing, Cape Canaveral AFB, Fla., planning; 4th Wing, Seymour-Johnson AFB, N.C., recycling. **Individual winners** are: Diane Arreola, Sacramento ALC, McClellan AFB, Calif., natural/cultural resources management; Dennis C. Tates, Reese AFB, Texas, planning; Mark A. Kershner, Patrick AFB, Fla., restoration; Suzanne W. Bilbrey, Reese AFB, compliance; Capt. Matthew T. Leonard, Travis AFB, Calif., pollution prevention; Scott J. Ammon, Whiteman AFB, Mo., recycling.

Bob Van Orman, director of environmental management, Hill AFB, Utah, has received the **1994 Secretary of Defense Individual Award for Environmental Quality**, the highest award for a Defense Department employee in the environmental arena. Van Orman oversees environmental matters for more than one million acres of DOD property in Utah and Nevada. The Utah Engineers Council also selected Van Orman as the **1994 Utah Engineer of the Year** from more than 10,000 engineers.

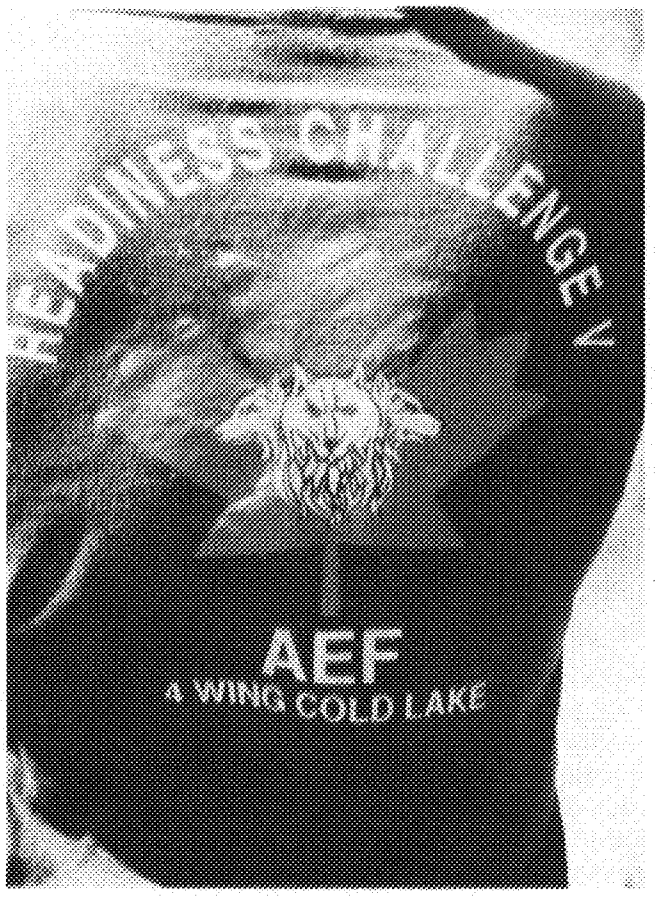
The recycling program at **Seymour-Johnson AFB, N.C.,** is the winner of the **Secretary of Defense Installation Recycling Award for 1994.** Seymour Johnson has been a pacesetter in the recycling arena. The first in the Air Force to start a **yard waste compost operation**, the base composed approximately three million pounds of yard waste during 1993 and 1994.

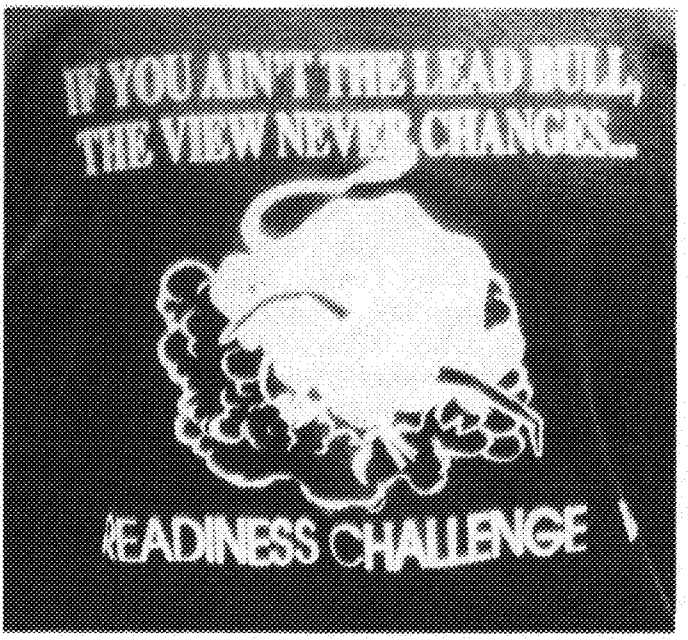
The winner of the **1994 Eugene M. Zuckert Management Award** is **Mr. James F. Boatwright**, former deputy assistant secretary of the Air Force (Installations). He retired in March after 39 years of federal service. Mr. Boatright recently led and managed the department-wide effort to rightsize the Air Force's basing structure for entry into the 21st century.

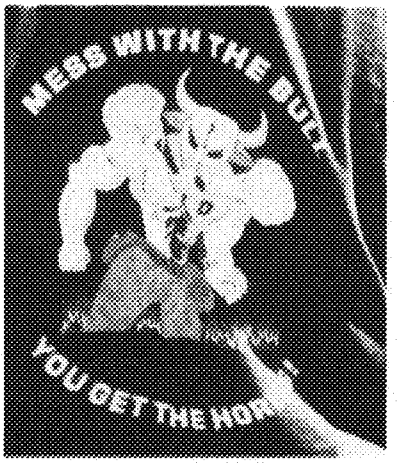
Stars on the horizon

Photo by SSgt. Rick Burnham

Two of the brightest young stars on the Air Force Pistol Team are SrAs. Jeff O'Connor (r) and John Pollert (l), both of the 325th Civil Engineer Squadron, Tyndall AFB, Fla. The pair traveled with seven other Air Force shooters to Camp Perry, Ohio, July 9-19 to participate in the nine-day National Pistol Championships, were representative from each of the military services and more than 800 civilians were expected to compete. Pollert, a heavy equipment operator, has been shooting for seven months. O'Connor, an exterior electrician, has been shooting for 14 months. Shooting scores for the two have risen dramatically ever since an impressive showing at the 1995 Texas State Regional in Houston Memorial Day weekend. O'Connor finished first in the expert class of shooters, while Pollert took top honors in the sharpshooter class. Pollert has since moved up to the expert classification. ***(Courtesy 325th FW Public Affairs)***







And the winner is...

SAFA