

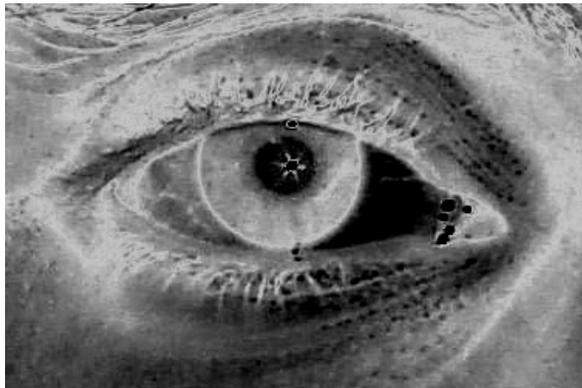
# FUEL LINE

Defense Energy Support Center

Vol. 2, 2001



U.S. Air Force photo



# Contents

## FUEL LINE

*Fuel Line* is an official publication distributed quarterly by and for the Defense Energy Support Center and fuel-oriented clientele. *Fuel Line* is prepared by desktop publishing applications and designed to provide timely, factual information on policies, plans, operations, and technical developments of the Center and interrelated subject matter. Views and opinions expressed in the *Fuel Line* are not necessarily those of the Department of Defense.

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On the cover: C-17 Globemaster III cargo aircraft; Lt. Col. Darko Pintaric; soybean field; human eye.

### **Protecting the Earth ..... 12**

DESC's Environmental and Safety division ensures that the agency complies with a multitude of regulations governing the prevention and cleanup of spilled fuel. But nature itself works to maintain an equilibrium when soil and water become contaminated. Meet the people behind the mission and learn about microbes that eat fuel and how electrical current can fight metal corrosion.

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Even if you have an aversion to government acronyms, remember this one—DARPA. They're the Department of Defense's most autonomous research agency, able to plumb the depths and scale the heights of originality. Find out what a fuel cell is and what it can do for soldiers who must transport large loads of batteries. Then find out how stress can create electricity.

### **The Faudi Filter—How to Save Fuel and Money ..... 28**

When personnel at a Louisiana fuel terminal discovered they had a bad batch of fuel on their hands, they had to determine how to keep on-specification product flowing to their customers. Instead of spending time and money to replace the fuel, could a filtration system doctor the fuel and bring it up to quality standards?

# From the Director



*DESC Director  
Jeffrey A. Jones*

**F**ifty-nine years ago, and just one year after the United States entered World War II, the Army-Navy Petroleum Board was established to ensure that the highest priority requirements for petroleum products in the European and Pacific theatres were met. From that critical start, the Board evolved into a joint purchasing agency. Many name changes later, the Defense Fuel Supply Center was formed and, in 1973, given responsibility for managing, not only petroleum procurement, but also bulk ordering, distribution and inventory management at the wholesale level.

Yes, 2002 will be DESC's 60<sup>th</sup> year. We are 30 years older than our parent organization, the Defense Logistics Agency! During this long and distinguished history, DESC has grown in breadth of responsibility because, as an organization, *DESC has always succeeded*. Whether allocating limited fuel supplies to frontline forces or buying and distributing natural gas and electricity in the home front energy battlefield of California, DESC has met the challenge.

Now DESC is facing new challenges—new tests from both the

outside and the inside. From the outside, we have increasingly complex energy policy questions concerning deregulation. We must pick our way through these higher risk issues one day and one state at a time.

On the inside we are on the verge of implementing FAS [Fuels Automated System] at the enterprise level—an event awaited by many for several years. FAS will bring new capabilities and provide

***...DESC has grown in breadth of responsibility because, as an organization, DESC has always succeeded.***

increasingly powerful tools empowering DESC managers to solve customer problems and in less time.

FAS will also bring changes in roles, missions and jobs. FAS will bring us closer than ever to completely fulfilling our Integrated Material Management charter. With

FAS, we will find ourselves on the frontlines with our customers—no longer arm's length removed with just a wholesale mission. As managers responsible for the entire supply chain right to the consuming equipment, *it will be imperative to understand the customer better than ever*—his mission, environment and systems. This will require a new customer-facing strategy and more of our people than ever will be engaged in customer-related issues. We will be looking at our quality force to be part of this customer strategy. We will also be evaluating software, perhaps this year, that provides collaborative tools so we can work more efficiently with our suppliers and their production cycles and match them to the needs of our customers.

Within a couple of years, DESC will be able to substantially increase its control of the military supply chain for petroleum and other energy products. We will be at the frontlines supporting U.S. forces wherever they are called to go. We will meet the challenges that face us as we enter our 60<sup>th</sup> year and beyond!★

# Earth Day at the Pentagon

**E**arth Day 2001 observances at the Pentagon included an April 24 panel announcement, led by Sen. Thad Cochran (R-Miss.), to introduce a new “environmentally friendly” paint that will be used within the next year to paint one-fifth of the Pentagon’s interior walls.

Developed by a research team from the University of Southern Mississippi, the paint uses castor oil in the formulation of its chemical base in place of a solvent to reduce pollutants released into the atmosphere.

“The bottom line is this technology uses castor oil, soybean oil or lesquerella oil to allow us to make latex polymers that have wide applications,” said Dr. Shelby Thames, leader of the research team. “Not just paints, but inks, adhesives, carpet backings, coating for fibers, coatings for concrete steel, just a huge potential for applications.” The technology is expected to reduce the amount of pollutants from 200 to 400 grams per liter of paint to as low as three grams.

Twenty thousand gallons of paint will be manufactured for the Pentagon paint job by Southern Diversified Products, a company based in Jackson, Miss. ★



*Sen. Thad Cochran, seated, far left, led panel introduction of environmentally sensitive paint at Pentagon on April 24.*



*Thomas Bee of Water Management, Inc., one of several exhibitors at the Pentagon’s observance of Earth Day, beside washing machine designed to use lower amounts of water, electricity and detergent.*

# NEWSMAKERS...



*DESC Director Jeffrey Jones, above right photo, listens as employees ask questions and make observations during brown bag luncheon gathering in April. Above left, Tom Rees and Mark Iden.*



*Navy Lt. Cmdr. David Fowler cuts cake at gathering commemorating his transfer from the DESC command office to the agency's Bulk Fuels commodity business unit.*

*The Joint Chiefs of Staff photographed in the Joint Chiefs of Staff Gold Room, more commonly known as The Tank, in the Pentagon on Jan. 11, 2001. From left to right are: U.S. Navy Chief of Naval Operations Vernon Clark, U.S. Army Chief of Staff Gen. Eric K. Shinseki, Vice Chairman of the Joint Chiefs of Staff Gen. Richard B. Myers, U.S. Air Force, Chairman of the Joint Chiefs of Staff Gen. Henry H. Shelton, U.S. Army, U.S. Air Force Chief of Staff Gen. Michael E. Ryan, and U.S. Marine Corps Commandant Gen. James L. Jones Jr. DoD photo by Mamie Burke.*



# NEWSMAKERS...



A KC-10A from McGuire Air Force Base, N.J., refuels a B-2 Spirit during a training exercise on March 23, 2001. Although the KC-10's primary mission is aerial refueling, it can combine the tasks of tanker and cargo aircraft by refueling fighters while carrying the fighters' support people and equipment during overseas deployments. U.S. Air Force photo by Gary Ell.

DESC Director Jeffrey Jones, left, presents Maj. Mark Valavanis, U.S. Air Force Reserve, with Defense Meritorious Service Medal for outstanding support to DESC on April 24, 2001.



Elizabeth Morgan, a supervisory inventory management specialist with DESC's Facilities and Distribution Management commodity business unit, was recently selected as the agency's "Employee of the Quarter."



# NEWSMAKERS...

## CROATIAN VISITORS

*Visitors to Fort Belvoir from the Croatian Armed Forces learned about DESC operations on May 1, 2001.*



*Blazenka Beslaj-Cifrek, left, and Lt. Col. Darko Pintaric.*



*DESC's Deputy Director Capt. Stuart Funk, SC, USN, left, George Atwood, DESC contracting officer, center, and Joy Mullori, contracting specialist, presented an overview of the agency's operations as well as procurement procedures. DESC representatives gave a similar presentation to visitors from a Japanese defense agency in April.*

# NEWSMAKERS...



*Sandra Secen*

## CROATIAN VISITORS



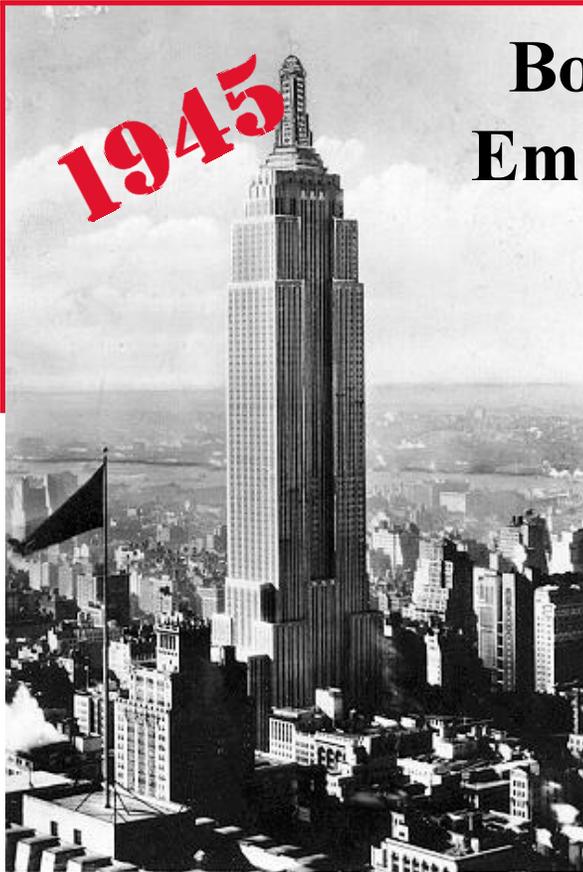
*Capt. Darko Markovic, left, and 1st Lt. Viktor Kolovrat*

## BRITISH VISITOR



*Rear Adm. Mike Wood of the United Kingdom's Defence Logistics Organisation is welcomed by DESC's Kathleen Murphy, acting counsel (lower left) and Larry Bell, Fuels Automated System program manager, on May 14.*

*Rear Adm. Wood, right, and DESC Director Jeffrey Jones during operational briefing.*



## Bomber Crashes into Empire State Building



A B-25 U.S. Army Air Force bomber crashed into the Empire State Building on July 28, 1945. Fourteen people were killed when the craft plowed through the 79<sup>th</sup> floor.

The plane's pilot, Lt. Col. William F. Smith, Jr., had left Bedford, Mass., to pick up his commanding officer in Newark, N.J. Because of dense fog hanging over New York City, an air traffic controller at LaGuardia Airport suggested that Lt. Col. Smith land at the airport. However, Lt. Col. Smith, apparently believing that diminished visibility would not seriously impede his flight, requested and received clearance to continue on to Newark. But the fog clearly caused the pilot to miscalculate his position. The bomber crashed into the side of the building, delivering the most damage to the office of Catholic War Relief Services where

Twenty-six people were injured, including an elevator operator who plunged from the 75<sup>th</sup> floor to the sub-basement when the elevator's cables broke. The intensity of the elevator's fall was lessened when the cables coiled up in the elevator pit, cushioning the impact.

The 12-ton bomber was traveling at 200 miles per hour when it hit the building, leaving a hole 18 by 20 feet; its wings were clipped off and the fuselage wedged into the towering structure as pieces of the wreck fell down on the street below. Fire burned on the 78<sup>th</sup> and 79<sup>th</sup> floors and in the basement from an engine and other burning plane pieces that fell down the

elevator shaft. In addition, the plane's other engine continued traveling through the edifice to the roof of a neighboring building, causing fire to break out there as well. Fire from the accident is contained quickly and prevented from spreading further. Within three months, the damage is repaired.★





## On the Run in War Torn Europe

### *“I Am Leo”*

Born in Vienna, Austria, and a Jewish survivor of the encroaching forces of Nazi Germany, Leo Bretholz chronicled his multi-year, multiple escapes from German forces and collaborators during an address sponsored by the Defense Threat Reduction Agency on April 18, 2001, at Fort Belvoir, Va.

“The hierarchy didn’t do anything to prevent what happened. Individuals did,” he said, describing the efforts of citizens who helped him as he dodged and broke free from various incarcerations and threats to his liberty.

On the night of October 31, 1938, at the age of 17, he left Austria to be smuggled into Luxembourg. (Destined for a monastery, he is instructed to say “I am Leo” upon his arrival.) He was told he would have to cross a shallow river, that he should carry a pair of dry socks in his pockets. But the water was considerably higher, and faster, than he anticipated—a telling indication of trials to come. “The current carried me. All I had to do was give myself direction,” he said.

And so began a harrowing flight that would not end until May 1944.

At one point, Mr. Bretholz found himself among the numbers bound for Auschwitz on a deportation train. Fellow passengers discouraged him from a planned escape from the cattle car. A frail woman on crutches, however, offered encouragement. “You must do it,” she told him. “Run! You will be able to tell the story.”

Mr. Bretholz tells the entire story in his 1999 book, *Leap into Darkness*.★

## A New Sense for Flight

### *Using Touch to Stay on Course*

When pilots inaccurately perceive the altitude, motion or attitude of their aircraft, a phenomenon referred to as “spatial disorientation” results. Obvious conditions such as fog and darkness need not be present for pilots to lose their bearings.

Vision and a sense of balance originating from the inner ear, the skin, muscles and joints play the largest roles in a pilot's orientation. But how can helicopter pilots maintain a stable hovering position when the spinning rotors kick up a cloud of dirt or snow, destroying any reference point to the ground? Or what about the glare of water or explosions? How can pilots keep a sense of perspective?

Through touch.

A new device, amounting to a vest with vibrating sensors, can “touch” pilots at various points on their chest and torso to relay information about the aircraft's position. The sensors pull information from the aircraft's electronic systems (avionics). Arranged in rows and columns throughout the vest, the sensors produce a buzzing sensation similar to a vibrating pager.

The Tactile Situation Awareness System was developed by Navy Capt. Angus H. Rupert, a NASA flight surgeon working at the Naval Aerospace Medical Research Laboratory (NAMRL) in Pensacola,

Fla., who refers to his brainchild as “an intuitive way of getting information without thinking.”

At the Navy League's 2001 Sea-Air-Space Exposition in Washington,

D.C., in April, attendees could test their flying skills, and the vest, on a helicopter simulator. While keeping their eyes on the screen, adventurers could direct the flight of the vehicle while receiving information via the



*Capt. Angus H. Rupert, MC, USN, left, and Hospital Corpsman 2<sup>nd</sup> Class Charles Eakle*



*Expo attendees try out the helicopter simulator and vest embedded with pneumatic sensors.*

## 2001 Sea-Air-Space

vest about the position of a hidden threat. The threat's position and direction of travel will both be communicated to the pilot. For example, if the threat is behind the chopper, to the right and moving forward, then the sensors will vibrate from the back bottom right of the vest and around the torso to the front.

Capt. Rupert carries a small black box with a thin cable attached, the end sporting one of the pneumatic sensors used in the vest. He demonstrates the feel of the activated sensor to interested parties. Bzzzzz.

According to figures presented by NAMRL, spatial disorientation costs the Department of Defense more than \$300 million each year in lost aircraft—aircraft destroyed due to spatial disorientation. The tactile system, currently in a developmental stage and being tested in various aircraft, also has applications for aerospace use and simulator training.★

The Navy League's



Exposition



F-14/18 Simulator System



Ground Proximity Warning System display

# DESC's Environmental Team— What They Do and Why They Do It

By Claire McIntyre

Sometimes the earth and petroleum meet unintentionally. Over time, pipelines and storage tanks corrode, develop leaks and spill once well-contained product onto surrounding terrain. Par for course though the contact may be, a variety of measures minimize potential harm to soil and water, often using the repairing forces of nature itself to clean the environment, renew resources and maintain equilibrium.

How toxic is spilled fuel? “This is petroleum, not plutonium,” says Paul Rogers, chief of the Defense Energy Support Center’s Environmental and Safety division. Under the right conditions, spilled fuel will be dissipated by wind and water and even devoured by naturally occurring microorganisms. Yes, the product can be harmful if not optimally stored and distributed. But state and federal regulations, combined with innovative cleanup responses, ensure that safeguards and remedies are in place.

Isn’t a Department of Defense fuel agency, though, going to make those claims to protect its interests? Not likely. Regulatory scrutiny, not to mention customer and public outcry, put a spotlight and high price on deficient operations. Throw in a

staff of environmental specialists and there aren’t a whole lot of places to hide.

DESC’s environmental team specializes in two major areas of concern: compliance (i.e., with state and federal regulations) and remediation (cleanup of fuel-contaminated areas). Each specialist is responsible for environmental matters at government-owned, contractor-operated fuel terminals located within a specific section of the country. They bring diverse backgrounds to their current challenges—they are chemists, engineers, former refinery workers and geologists.

They look out for the earth. And they save the government money.

## *Time, Money and Pigs*

A couple of developments in the last several years have had a huge effect on DESC’s success in preventing and responding to oil spills, according to Mr. Rogers. The first factor is timeliness—starting the actual cleanup of a spill as soon as possible. “It’s not that complex,” observes Mr. Rogers in reaction to



*Paul Rogers*

spill cleanup contractors who make lengthy studies before beginning cleanup. “A spill doesn’t have to be studied to death before it can be cleaned up.” The longer the wait to take action, the more extensive the damage will likely be, the more expensive the procedure. The time span can vary anywhere from immediate action to a wait of two or three months.

In the last two years, DESC has implemented “rapid response contracts” with environmental firms that not only provide quick response to terminal fuel spills, but also decrease the volume of reports that spring from the process. “We emphasize more site work and less report writing,” says Mr. Rogers. The contracts also avoid unnecessary costs incurred with “Cadillac cleanups.”

The second factor that has significantly improved DESC's environmental mission is the use of leak detection devices for both storage tanks and pipelines. Leaks can be small and hard to detect, especially in huge tanks and underground pipelines. Terminal automation, including automatic fuel handling equipment and automatic tank gauging can often be upgraded to include leak detection systems. "IT [information technology] software is allowing us to integrate leak detection in existing automated systems at the terminals," says Mr. Rogers. While virtually all DESC fuel terminals, or Defense Fuel Support Points, employ some type of leak detection, automated methods are more prevalent at the larger facilities; smaller terminals are slowly integrating the new technology.

Less automated methods of leak detection include "pigging" and tightness testing. The first method consists of pushing a device called a pig, anywhere from four to 18 feet long, through the length of the pipeline to detect corrosion by detecting variations in the thickness of the pipe wall. (Pigs are also used to clean pipelines; those used to detect corrosion are referred to as "smart" pigs.) Tightness testing can involve sending gas through a pipeline or tank to detect leaks where the gas escapes.

Most leak detection devices are designed for smaller storage tanks. So what do you do if you have larger tanks holding 3.2 million gallons of fuel each and state regulations require that those tanks still detect the same volume of leakage as smaller tanks? By way of illustration, the surface of a larger tank may be 125 feet across. If a small leak is present and the fuel level goes down

1/16<sup>th</sup> of an inch, it may be a lot of fuel lost, but it would be very hard to detect because of the width of the tank. In smaller tanks, that same volume of lost fuel would be much easier to detect.

So, if California standards required the bigger tanks to detect the same amount of loss as the smaller tanks, which, relatively speaking, would be a considerably smaller loss in relation to the size of the larger tank, how could DESC respond to a virtually impossible requirement?

By educating the state regulators about the disproportionality of the requirement, then negotiating a resolution. In this case, more frequent tightness testing satisfied the standards of the most environmentally stringent state in the union.

Talk of corrosion and state regulations raises more questions. What causes corrosion? Why is California so stringent? Keep reading. Members of the DESC environmental team are poised to reveal more.

### *Seeping Fuel*

Most fuel spills happen on land. (Spills on the water are usually addressed with absorbent materials or vacuum equipment.) The critical element of a fuel spill on land is the direction and depth that the fuel travels through the ground—whether or not it gets into the drinking water. This is where variables take center stage. Is the ground porous or filled with clay? Clay or bedrock will trap fuel; porous soil will allow the fuel to travel more easily. How far down is the drinking

water located? Ground water will carry the spilled fuel farther away from the site of the spill, spreading diluted residue, or plumes, to outlying areas.

Tests are conducted quarterly to track ground water changes as it rises and falls with the seasons. Recovery wells are sunk into the ground to suck up free product; skimmer wells, part of a pump and treat system, purify contaminated water. The more complicated part comes in determining what's going on underground and deciding on the best course of action. That's where nature enters the scene in remarkable fashion.

### *Stealing Electrons*

Wayne Barnum grew up on a farm in upstate New York and



*Wayne Barnum*

graduated from college with a degree in landscape architecture. He talks about mowing the lawn, an enormous spread of ground, with a push mower, about do-it-yourself roof replacement, about a pig named "Arnold," about tree identification. He tells about how the president of

*continued on page 16* ↗

# The Defense Energy Support Center's



*Hasan Dogrul: As a chemist, he determines the forensic make-up of fuel, sometimes a critical factor in determining the origin of spilled fuel when more than one source may be possible. As a veteran of oil spill cleanups, he lauds the performance of fuel terminal personnel in responding to emergencies.*



*Cindy French-Smith: "In the event of an oil spill, the first objective is to go from an emergency to a non-emergency situation as soon as possible. It pays to practice and go through the oil spill drills," says the chemist.*



*Jack O'Donovan: A civil engineer, he has spent 10 years in the environmental field. Defense Fuel Support Points located in Korea and Japan generally follow U.S. Department of Defense environmental standards. "Every remediation has its own idiosyncrasies," he says about the array of variables that make each site cleanup different from the next.*



*Diane Whitney: As DESC's safety manager, the former fire fighter has responsibility for all safety matters relating to DESC's government-owned, contractor-operated fuel terminals and offices around the world.*



*Joe Trani: See his article on phytoremediation, the use of plant roots to remove toxins from soil, in Fuel Line, Vol. 3, 2000. Mr. Trani is an environmental engineer with DESC's Los Angeles office.*

# Environmental Team. . .



*Tom Riffe has been working on a contracting initiative that will enable DESC to directly award its contracts with environmental firms rather than going through the U.S. Army Corps of Engineers, Naval Facilities Engineering Command, or the General Services Administration. The contracts will cover the following services: preparation of environmental plans and manuals; environmental audits; occupational safety and health services; pollution prevention studies and assessments; and oil spill response training.*



*Richard Kennedy will lead DESC's environmental support for its new missile fuels mission. DESC is scheduled to take over the management of the Air Force's Directorate of Aerospace Fuels located in San Antonio, Texas, later this year. Missile and rocket fuel, says Mr. Kennedy, is considerably more hazardous than DESC's other fuels and will require different procedures to respond to spill cleanup and to ensure environmental compliance.*



*Kola Olowu: The one-time refinery worker observes that, when fuel terminals are retired from service and returned to a community or military service, "DESC must clean the site to the level negotiated with the state."*



*Steve Deatherage: As a geologist, he studies the composition of soil and how it will affect the way oil degrades. When fuel spills on the ground, it meets a barrier, whether water, clay or some other non-porous layer of earth. Over time, it may travel farther away from the initial spill site, depending on various factors including soil makeup, the flow of ground water and the tilt of the land. "As you get farther from a light bulb, it gets dimmer and dimmer," he says describing the dissipation of oil as it moves away from the site of a spill. Soil samples taken at various points in a spill area allow environmentalists to determine the scope of contamination; monitoring of ground water and soil may continue for years after a spill. Mr. Deatherage also monitors the agency's pesticide usage, which has declined considerably in recent years in favor of mechanical (i.e., edging, mowing, clipping) methods of control.*

his college told his graduating class that only 15 percent of the graduates would get jobs as environmentalists, but that that was fine because the rest of them would get jobs in other fields and bring their environmental education to those other fields, that their training would affect the way they made decisions in whatever work they entered. He tells about a classmate who became a prison guard and now serves as a captain with the New York state prison system and how, when prisoners drop a piece of paper, the one-time environmental-graduate-turned-law-enforcer makes them pick it up.

“Sometimes we spend way too much money when nature really does it for us,” says Mr. Barnum about fuel cleanup procedures. “Nature has a way of changing everything over time. It makes much more sense to spend money on ground water contamination than on areas where the fauna and flora are not impacted. We do studies, or risk assessments, where we determine the impact to the environment. Sometimes the result of that assessment says ‘do nothing.’” But doing nothing does not mean that the land and soil will remain the same after a spill. Over a span of years, even fuel that seeped down deep into the soil will dissipate.

He speaks of rust and corrosion and the debate over whether the process is electrical or chemical but that, in any event, electrons from a metal surface are stolen by some other presence, whether it’s another piece of metal or salt or a rock, resulting in corrosion. Which leads to a mainstay of the environmental approach to fuel cleanup. . .

Bioremediation. There are microorganisms that eat fuel. More technically, they eat the hydrocarbons that comprise the fuel. In simple terms, microorganisms go to work on contaminated soil, cleaning the earth and returning it to its pre-fuel condition. Natural attenuation refers to the earth’s ability to repair itself over time.

In cases where government fuel facilities are retired from service, DESC must clean up the land before returning it to the local community. Portions of the cleanup can entail monitoring natural attenuation over the course of 20 years or more.

How cost-effective is it to use the forces of nature for cleanup? “It might cost 1 million dollars to clean up 99 percent of an affected area,” Mr. Barnum hypothesizes. “And it might cost 100 million dollars to clean up 100 percent of that area. We say, ‘Let nature take care of that other 1 percent.’”

### *Juice in the Pipeline*

Bill Middleton gives an insider’s view on California’s regulatory stringency. “They’re not necessarily more progressive than other states,” he says. “With a 900-mile coastline, they’ve got more wildlife and plant diversity. There’s simply more to be concerned about.”

He notes that environmental legislation and mandates took off in the 1970s with passage of the Clean Air and Clean Water Acts and recognizes that regulatory talk can be abstract and overwhelming. He selects a concrete example of the immensity of federal requirements.

***An electrical current running through a pipeline prevents weakening of the pipe’s walls, thereby preventing leaks, spills, environmental contamination, and the need for cleanup measures.***

As with any project or incident that may have an adverse effect on the environment, federal regulations require the filing of an environmental impact statement or report that describes the impact and how it may best be mitigated. According to Mr. Middleton, postage to mail out the



*Bill Middleton*

environmental impact statement for the doomed “Super Collider” to all interested parties cost the U.S. Department of Energy \$3.7 million. [In 1987, work began on the Superconducting Super Collider in Texas, an accelerator that served as a giant laboratory, about 50 feet in diameter and more than 200 feet underground, for the study of

subatomic particles. The project met its demise in 1993 due to lack of funding.]

“All spills are not created equal,” he observes. “Pipeline diameters differ, so do climate and the surrounding area. State regulations differ a great deal, too, and DESC has built rapport among the regulators. Negotiations work very well.” Mr. Middleton made more than 20 trips to California in 1998 to resolve the issue of leak detection standards for large fuel storage tanks. He notes that negotiations often include a variety of individuals: military officers, engineers, lawyers and environmentalists.

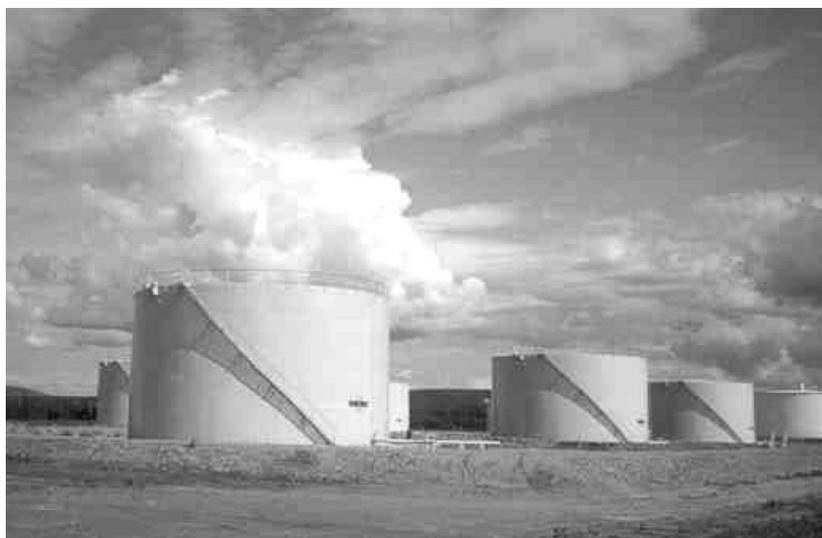
Pipeline corrosion, he points out, can be prevented by cathodic protection, a process where low-current electricity is sent throughout the pipeline’s metal, interfering with the transfer of electrons away from the pipeline that results in metal degradation. An electrical current running through a pipeline prevents weakening of the pipe’s walls, thereby preventing leaks, spills, environmental contamination, the need for cleanup measures. . .

Microbes eating their way through mounds of gunky soil clean the earth. Voltage humming through fuel terminal pipelines protects the steel. A team of environmentalists keeps watch.

Wayne Barnum’s college president wanted a concern for the environment to ring throughout a spectrum of undertakings. He’ll be happy to know that a Department of Defense fuel agency helps to make good a scholarly vision. ★

## Envirofacts

- A pipeline leak at the Alaskan Defense Fuel Support Point in 1993 served as a catalyst for formulation of DESC’s environmental cleanup and response initiatives.
- DESC’s safety office conducts annual inspections of the agency’s Defense Fuel Support Points worldwide to ensure compliance with federal and local regulations.
- What constitutes a serious spill? Anywhere between 500 and 1,000 gallons of fuel. Fifty to 100 gallons of spilled fuel is considered negligible; the soil may simply be excavated (dug up and removed).
- JP-4 fuel, replaced in more recent years by JP-8, contained higher concentrations of benzene, a carcinogen, and, thus, posed greater health concerns than today’s lower-vapor jet fuels.
- DESC’s Environmental and Safety division dispenses 25 percent of funds available under the agency’s Maintenance, Repair and Environmental program.
- In environmental jargon, “critter” refers to any living creature, including microbes.
- For more information on DESC’s environmental division, including a listing of the staff’s areas of responsibilities, phone numbers and e-mail addresses, visit the DESC Web site at: [www.desc.dla.mil/main/enviro.htm](http://www.desc.dla.mil/main/enviro.htm).



# Decision Making

## *The Mechanics Behind the Process*

*(part three in the travels of an upward mobility employee)*

By Paul B. Jones

Every working day, we make business decisions. Good, bad, or indifferent, the decisions we make affect our coworkers, our supervisor, our supervisor's boss, and ourselves. How do you make good decisions? What constitutes a good decision? How do you know a good decision when you see one?

These and other questions were answered when I took a Management Concepts, Inc. (MCI) class as part of my multifunctional program enhancement course of study. The enhancement activities are designed to give multifunctional participants management training in order to successfully complete the program and be certified. MCI offers two- to three-day courses in budget, acquisition, management, and leadership skills at Vienna, Va., and Washington, D.C. locations.

A good decision maker should not be afraid to make decisions. Nor should a decision maker be afraid to take responsibility for his or her decision. At the beginning of the decision making process, the question that needs to be asked is: Is it your decision to make? Sometimes it is not. It is important to recognize this pitfall before making this mistake. It is also

important to realize that not making a decision is making a decision by default.

How important a decision is determines whether or not it is made with input or without input. Some decisions are made with available information readily on-hand. Other times, you need coworkers' feedback as well as your supervisor's input. Past mistakes and experiences are the building blocks for making better decisions in the future.

One of the better matrixes used to make a decision is:

1. Evaluate the facts.
2. Evaluate the people affected by the decision.
3. Come up with options.
4. Look at the options by:
  - Cost to implement.
  - Time/effort to implement.
  - Does it meet the desired results?
  - Decide if you need input from people.
5. Make a decision.
6. Take responsibility for the decision.
7. Work hard to make sure it is properly implemented.

Sometimes the decision does not work and you have to cut your losses and regroup. One reason a decision may fail is that it was not implemented properly. The reason you get other people involved in the decision making process is to ensure multiple ownership of the decision. The more people that own a piece of the decision, the more likely they will work hard to see that it has a successful outcome.

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***Decisions are on display for everyone to see. They clearly reveal the way you view the world and yourself.***

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Different management styles lend themselves to different ways of arriving at a decision. There is the individual who uses his/her vast experience within their field of expertise to make a decision quickly and accurately. There is the individual who gathers all the facts related to the decision and uses the time to slowly incubate a decision in due time. And finally there is the individual who gleams every last miniscule detail possible about the facts and then sits and will not come

to a decision until forced into it either by time or an outside force.

Decisions are movements along a path at an incremental rate. There are pauses and gestation periods when you collect information and assimilate it. You have to think about how you've formulated your decision so you can defend it because, chances are, someone's going to question it. Sometimes there is a small victory where the decision maker achieves only partial success. Other times it is a major win with the decision maker receiving accolades and the endorsement of senior management.

Decisions are mirrors of personal thoughts, feelings and beliefs. They are on display for everyone to see. They clearly reveal the way you view the world and yourself. Your decision reveals your beliefs about:

1. Personal integrity
2. Intuition
3. Insight into your own worth

If I learned nothing else from this course, it is that personal integrity counts. People with integrity will not fool themselves about a situation. They have learned to trust their intuition and will not look to others to make their decisions. The questions I have learned to ask are:

1. Have I looked closely enough at my past decisions to learn from them?
2. Have I done a reality check by observing what is really going on around me?
3. Have I noticed the obvious?
4. Do I see the truth?
5. Am I telling myself the truth?



**Past mistakes and experiences are the building blocks for making better decisions in the future.**

U.S. Air Force photo.

During my work at DESC, including visits to some of our field offices and fuel terminals, I've been struck by the integrity of the employees. This characteristic, I believe, makes the Defense Energy Support Center a world-class organization. Integrity is knowing the truth and standing by it. Honesty is telling the truth to others. The people of DESC decide to do this day in and day out.★

*Paul Jones is a commodity business specialist in DESC's Facilities and Distribution Management commodity business unit and a participant in the agency's upward mobility training program.*

***Read on. Energy conversion technologies, a telescope-equipped Boeing 747, an increased U.S. presence in space, and a new DoD energy policy for California military installations...*** ✍️

# Trucking Fuel During Emergencies

## *Proposed ACES Program Puts Army Trucks on the Road*

Suppose that the transport and delivery of fuel to military installations by commercial suppliers was interrupted by unusual conditions, say, a hurricane or earthquake, or maybe a truckers' strike, vandalism by terrorists, or a pipeline break. And let's say that the damage to facilities or other operational impediments resulted in fuel shortages that were not significant enough to qualify as a national emergency under FEMA (Federal Emergency Management Agency) guidelines, so no federal aid would be forthcoming. Who can help and how?

The U.S. Army Reserve may be the answer. According to Master Sgt. Ed Lisowski, an Army reservist serving with the Defense Energy Support Center's (DESC) Houston office, 70 percent of Reserve trucks are on standby, waiting for the next wartime contingency. Under his proposed ACES (Americas Contingency Energy Solutions) program, Army active, Reserve and National Guard units could put their trucks to good use to fill the gap during disruptions to fuel deliveries within the continental United States.

ACES is designed as a volunteer program that would include a two-week training period for selected active and Reserve units to transport fuel to DESC customers. (Under POLEX, the U.S. Army Reserve's

Petroleum, Oil and Lubricants Exercise, reservists deliver fuel in place of contractors for a one- to two-week period each year. But whereas POLEX is more of a wartime exercise, ACES, as a contingency operation, would provide year-round emergency fuel transport. Required paperwork would largely be completed in advance, eliminating administrative delays.) DESC quality surveillance representatives would monitor safety and quality concerns during the ACES training.

"Most Reserve and National Guard units have no idea what DESC is," says Master Sgt. Lisowski. "ACES will put trucks to work during situations that aren't serious enough to be classified as national disasters, but that are more than the commercial contractors can handle in a timely manner."

While military services are prohibited from competing with private contractors to transport fuel for ordinary needs during peacetime, military units may step in during emergencies or short-term training to deliver product to DESC customers. In addition, most military bases do not have as much fuel storage space as they once had due to downsizing and closures. Thus, if fuel requirements rise suddenly, for example, during an unexpected



*Master Sgt. Ed Lisowski*

military deployment, assistance may be required to transport fuel on an expedited basis beyond the ordinary capabilities of commercial carriers.

Currently in a developmental stage, ACES is designed to serve all states in the eastern United States as far west as Texas, as well as Puerto Rico. Plans call for a fleet of 32 Army POL (petroleum, oil and lubricants) truck companies and more than 2,000 trucks to deliver fuel under the program during emergencies.★

*[While only a select number of Army petroleum transportation units will participate in ACES during 2001, additional Army units may volunteer for the program in 2002. For more information, call Master Sgt. Ed Lisowski at 713-718-3883 or access the DESC-Houston Web link at: [www.desc.dla.mil/main/aboutdfs.htm](http://www.desc.dla.mil/main/aboutdfs.htm).]*

# From Scott Air Force Base. . .

## *First Base to Use Biodiesel in All Diesel Vehicles*

**S**cott Air Force base announced on April 10, 2001, that it will become the first U.S. Air Force base to use biodiesel in all of its diesel vehicles. The program will serve as a model for other military bases to begin using the alternative fuel next year.

Biodiesel is a clean-burning fuel made mostly from soybean oil. Although biodiesel contains no petroleum products, it can be blended with conventional diesel at any level. This May, Scott is scheduled to begin using B20, a commonly used blend of 20 percent biodiesel and 80 percent petroleum diesel, in 270 vehicles. It will not be used in planes.

“One of the main reasons we’re using biodiesel is to meet the government’s goals of reducing emissions and reducing dependence on foreign oil,” said Master Sgt. Ron Guay. “We like biodiesel because there’s no need to make modifications to our vehicles or infrastructure, and our mechanics need no additional training.”

The transition to B20 will be seamless for the base, located about 30 miles east of St. Louis, Mo. As with petroleum diesel, procurement will be handled through the Defense Energy Support Center (DESC). The B20 will be delivered to various sites throughout the country to be

used by both military and civilian fleets.

“I don’t anticipate any problems whatsoever,” Master Sgt. Guay said. “Millions of gallons of biodiesel have already been tested and used in the real world by real fleets.”

Biodiesel can be used in any diesel engine, usually with no modifications to the engine necessary. It performs comparably to diesel, with similar cetane and BTU content. It offers excellent lubricity and is the safest of all fuels to use, handle and store. More than 60 major fleets use biodiesel and the fuel has proven successful in more than 40 million road miles. Biodiesel can be used to meet Alternative Fuel Vehicle purchase requirements of the Energy Policy Act of 1992 as well as the goals of Federal Executive Order 13149.

Biodiesel is registered with the Environmental Protection Agency (EPA) as a fuel and fuel additive. It is the only alternative fuel to have passed the rigorous health effects testing requirements of the Clean Air

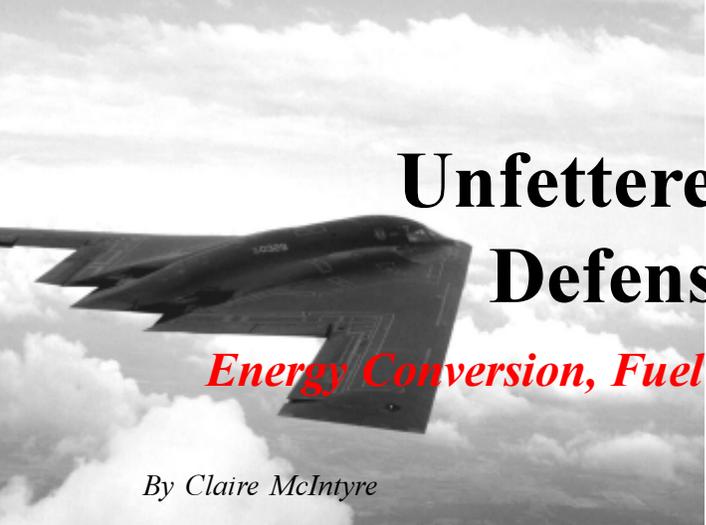


*Soybean field*

***Biodiesel is a clean-burning fuel made mostly from soybean oil and can be used in any diesel engine, usually with no modifications to the engine necessary.***

Act. Those test results show biodiesel reduces carcinogenic air toxins by 75 to 90 percent compared to diesel. The results, submitted to the EPA in 2000, also show that biodiesel is non-toxic, biodegradable and free of sulfur. It is available in all 50 states and has been proven successful in 40 million road miles. More than 60 major fleets currently use biodiesel. ★

For more information about biodiesel, visit [www.biodiesel.org](http://www.biodiesel.org).



# Unfettered Frontiers of Defense Research

## *Energy Conversion, Fuel Cells and the Soldier in the Field*

By Claire McIntyre

Where within the U.S. Department of Defense is technological research allowed to run unencumbered by governmental bureaucracy, at a faster pace, at the farthest reaches of novelty, independent of many restrictions visited upon other research and development organizations? At the Defense Advanced Research Projects Agency (DARPA).

It all started in 1958 with DARPA's founding in response to the launch of the Russian satellite Sputnik—a technologically challenging event for the United States. If a world super power is going to retain its status, it has to know more than the next country. And that requires not just staying abreast of advances, and not just inventing new technologies, but *exploiting* discoveries, putting them to use. That's another one of DARPA's defining characteristics—its ability to exploit science for use in military systems.

They don't put large amounts of resources into basic research, instead pulling discoveries from government, universities, non-profits and corporations for practical military applications. The Internet, for example, took form due to DARPA's efforts. Although the

exact origin of the initial technology may be difficult to pinpoint, DARPA was responsible for making the system applicable—that is, using computer networking capabilities to form a revolutionary mode of communication. The military always needs advanced communication systems. DARPA used developing computer technology to answer the need in a profound new way. The Internet was born, resulting in worldwide repercussions.

By and large, permanent technical staff doesn't exist at DARPA. Scientists and technical experts serve an average of four years with the agency and then depart for points elsewhere. The turnover adds to DARPA's flexibility and fast-track approach to problem-solving. In addition, like any government agency, DARPA hires contractors from a variety of sources who work with staff members. Military personnel also work closely with DARPA staff to ensure that the agency's projects are answering the needs of the community served by the research.

Weapons systems, biological warfare, night vision sensors, radar, body armor, sonar, satellites, remotely controlled vehicles, space surveillance, microsystems, the B-2 Stealth Bomber, the M-16 assault

rifle, the computer mouse—they're all part of DARPA's inventory.

What about energy? Is DARPA doing anything unusual there?

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**The challenge arises: How can one type of energy be converted into another to avoid the limitations of batteries?**

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First, consider the following. Soldiers in the field must carry many pounds of batteries in order to power their equipment, to have a source of energy. The conventional lithium sulfur dioxide battery may provide excellent performance, but the weight and energy storage capacity are limiting. So the challenge arises: How can one type of energy be converted into another to avoid the limitations of batteries? In this case, how might the soldiers' load be lightened?

Dr. Robert Nowak is a program manager with DARPA's Defense Sciences Office. As such, he spearheads the agency's effort to develop energy conversion technologies. He illustrates the battery problem by presenting a scenario. "A Special Operations

## Can electricity be generated from the heel of a soldier's

Forces team might have to carry more than 50 pounds of batteries. They will carry less food rather than fewer batteries,” he observes, adding that soldiers may lose as much as 20 pounds as a result of decreased food intake.

molecule.” In the case of a fuel cell, hydrogen molecules enter the anode, where they break down into protons and electrons. The hydrogen ions (protons) move through the electrolyte to the cathode, where they join with oxygen from the air and form water. As the electrons

And the fuel cells are much lighter and easier to transport than batteries.

But Dr. Nowak is not entirely satisfied with the current fuel cell. Hydrogen tanks need to be carried with the fuel cells. The challenge, he says, is to develop a cell that will run off a logistical fuel already present in the field—like JP-8.

“The next challenge is how to produce hydrogen from chemical sources,” he says. “Methanol contains hydrogen and it’s very cheap—50 cents a gallon. But for military applications, you still need to bring methanol out to the field.” However, a fuel cell that runs off a methanol solution has arrived, adds Dr. Nowak. He predicts that methanol-powered fuel cells will be used for cell phones within the year.

Under its Palm Power initiative, DARPA recently issued a solicitation for energy conversion systems for three hypothetical military missions—a three-hour robotic reconnaissance mission, a three-day land warrior mission, and a 10-day special operations reconnaissance mission. Responders were asked to develop systems that operate at the 20-watt level. The idea is to keep the size of the device very small while still delivering enough electricity for missions that vary in length and required total energy. JP-8 is DARPA’s first choice to fuel the systems, but they are accepting technologies built on other fuel sources provided the project’s goals are met.

Some of DARPA’s most unusual and thought-provoking energy research lies in “energy harvesting”—obtaining energy from the environment. A conventional

boot as it strikes the ground?



*Left to right: Col. David Maltby, commanding officer of the Marine Corps Communications and Electronics School; Robert Nowak, DARPA program manager; and Brig. Gen. Joseph F. Weber, commanding general, Marine Air Ground Task Force Training Command, display fuel cell during demonstrations at 29 Palms Marine Corps Base.*

One of Dr. Nowak’s prime projects has been development of a fuel cell to replace the batteries. Simply stated, a fuel cell contains an electrolyte that sits in between two electrodes (an anode and a cathode). When a fuel is introduced into the cell, in this case, hydrogen, it is converted into electricity. There are no moving parts and no noise. The “intrinsically efficient” conversion of hydrogen to electricity, explains Dr. Nowak, results from a chemical reaction.

“All you need to know about chemistry can be stated in one sentence,” he says. “One molecule hands electrons to another

travel from the anode to the cathode, they provide electricity to devices along the way.

In 1999, the hydrogen-based fuel cell was demonstrated during three exercises at California’s 29 Palms Marine Corps Base. The fuel cells were developed by Ball Aerospace & Technologies Corp. in cooperation with DARPA, Special Operations Command, and the Army. How successful were the demos? Operation of fuel cells are now part of standard training at the base. Whereas test use of hydrogen-based fuel cells came to \$250, the use of standard batteries in the same situation would have cost \$8,000.

continued on page 24

*DARPA...  
continued from page 23*

example, photovoltaics, or solar energy, remains expensive and the materials, rigid, although research continues to bring down the cost and to make the equipment more flexible.

But venture into the realm of true novelty and discover “heel strike” power. Can electricity be generated from the heel of a soldier’s boot as it strikes the ground? This time around, the research centers on converting mechanical energy to electrical energy. It’s all in the boot, or more specifically, in the material of the boot.

“When you put a stress on some materials, it creates energy,” explains Dr. Nowak, referring to piezoelectric materials, or electrorestrictive polymers. So if the right material is

placed in the heel of the soldier’s boot, each step will produce a stress that will then produce energy. Even a flag blowing in the wind will produce electricity, he observes, if the flag is made out of a special material. Or place that same material underwater (referred to as energy harvesting eels) and let ocean currents serve as the stressor. Again, the result is electricity.

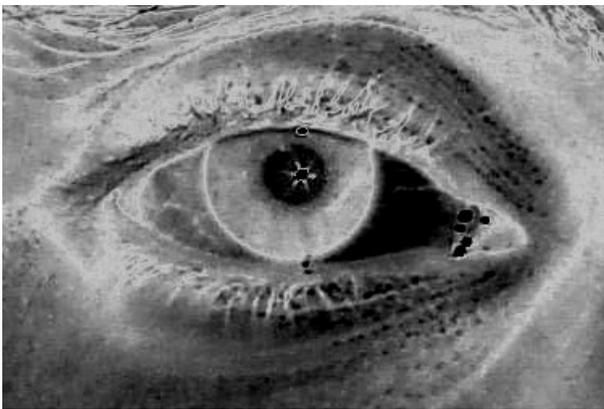
While this may all be still in the research stage, sporting goods have already made use of piezoelectric materials. Some tennis racket and ski manufacturers have incorporated the material into their products with the claim that it contributes to improved performance.

But the research goes even farther out beyond ordinary bounds. To return to the fuel cell, a biofuel cell currently under development operates off the glucose in the

human bloodstream. Whereas hydrogen powered the fuel cell out in the field, glucose serves as the energy source for this fuel cell. Because the device contains electrodes to sense glucose, the cell, implanted under the skin, could be valuable for diabetics who need to monitor their glucose levels. In addition to sensing glucose levels, the biofuel cell could power an implanted insulin pump, which would serve as an artificial pancreas.

Return to the field for a moment. Glucose, a sugar, is found in nature, for example, tree sap. One day, speculates Dr. Nowak, maybe soldiers will create electricity by attaching a biofuel cell to a tree.

Failure doesn’t faze DARPA. Many of their projects are high-risk with no guarantee of success. They just regroup, rethink, refine, and head back out to the field.★



***What is biometrics and how does it fit into Department of Defense security efforts? See page 32.***

### **DoD Fraud Hotline Alert**

To report instances of fraud, waste, abuse, or mismanagement in Defense Logistics Agency/ Department of Defense programs and operations, contact one of the following:

- a. Visit the DLA Complaint Program Web site: [www.dla.mil/dss/dss-s](http://www.dla.mil/dss/dss-s).
- b. Call the DLA Complaint Program at 1-800-411-9127 or Defense Switched Network (DSN) 427-5447.
- c. Write to: Stephen M. Keefer (DSS-S), Defense Logistics Agency, 8725 John J. Kingman Road, Suite 2533, Fort Belvoir, VA 22060-6221.
- d. Visit the DoD Defense Hotline Web site: [www.dodig.osd.mil/hotline](http://www.dodig.osd.mil/hotline).
- e. Call the DoD Defense Hotline Program at 1-800-424-9098.
- f. Write to: Defense Hotline, The Pentagon, Washington, DC 20301-1900.
- g. Visit the DoD Defense Hotline by e-mail: [hotline@dodig.osd.mil](mailto:hotline@dodig.osd.mil).

# Largest Airborne Telescope to Take Flight

*Plane to Give Scientists Clearer View of Universe*

Equip a plane with a high-powered telescope. Then send it out into the stratosphere. It may reveal a thing or two about the universe beyond the capacity of other technologies.

A modified Boeing 747, called SOFIA (Stratospheric Observatory for Infrared Astronomy), is slated to make its first official flight in 2002. Although planes have carried telescopes before for astronomical viewing, SOFIA's equipment will be considerably more powerful and sensitive—the largest telescope, in fact, to go airborne.

Infrared energy from the sky is not easily observable because of interference from water vapor in the earth's atmosphere. But a telescope-equipped aircraft flying at 41,000 feet can get past obstacles to viewing infrared energy. Satellite telescopes also achieve a clear view of infrared energy but have some disadvantages in comparison to the aircraft—i.e., greater cost, less accessibility and mobility.

Many astronomical bodies emit energy in the form of infrared light, which is often invisible. Infrared light is one point on the electromagnetic spectrum that includes visible light, radio waves and x-rays.

A portal located behind the plane's left wing will open to expose the telescope, including a mirror eight feet in diameter. The plane will travel at 550 miles per hour.



*Boeing 747SP ("SP" designates a shorter-body plane than the original model) before modification into the SOFIA astronomical observatory. Black square at rear of plane marks future location of telescope. The plane was first purchased by Pan American World Airways in 1977. Ownership switched to United Airlines in 1986, then to NASA in 1997.*



*To see an animated video of SOFIA in flight, access [www.sofia.arc.nasa.gov](http://www.sofia.arc.nasa.gov).*

SOFIA is a joint effort between NASA and the German Aerospace Center. Raytheon Aircraft Integration Services of Waco, Texas, is modifying the aircraft for its new

telescopic mission. Scientists will be able to study an array of phenomenon with SOFIA's technology, including planets, asteroids, comets, star formation and demise, and black holes. ★

United Airlines will operate and maintain SOFIA at NASA's Ames Research Center at Moffet Field, Calif.

S O F I A ' s predecessor, the Kuiper Airborne Observatory, operated in a Lockheed C-141 from 1971 to 1995.

# Space ‘Increasingly Important,’ SPACECOM Chief Says

Source: *American Forces Press Service*

WASHINGTON—American military involvement in space will become more critical to national security in coming years, said U.S. Space Command’s top officer.

“Most anyone involved in military operations, whether military or civilian, would tell you space is becoming increasingly important,” Air Force Gen. Ralph E. Eberhart, SPACECOM commander in chief since February 2000, said in a March 28, 2001, interview with the American Forces Information Service.

U.S. Space Command, at Peterson Air Force Base, Colo., coordinates the use of U.S. military and civilian space assets to support, enhance and control space operations and computer-network defensive and offensive missions. It is one of the nine unified commands in DoD that have operational control of U.S. combat forces.

Satellite imagery, missile warning and targeting information that space-based systems provide have proven their military worth to U.S. defense planners throughout the past decade, Eberhart said. That data, for instance, contributed to victory during Operation Desert Storm and the 1999 Kosovo air campaign, he noted.

“Look back to how we leveraged our space assets in Desert Storm, compare that to Kosovo—or how

we can leverage them even today as we have made advancements since Kosovo—and I think it is obvious how important and how much we rely on capabilities that are resident in our information that moves through space,” he said.

Secretary of Defense Donald Rumsfeld is expected to provide his formal response to recommendations in a report issued Jan. 11 by the Commission to Assess U.S. National Security Space Management and Organization [for the text of the secretary’s recommendations, see May 8 DoD press release at: [www.defenselink.mil/news/releases.html](http://www.defenselink.mil/news/releases.html)]. Prior to his nomination to be secretary, Rumsfeld chaired the commission, which, among other things, sought to determine if any changes need to be made to improve the United States’ national security posture and capabilities in space.

Six months of research and interviews with the country’s leading space experts, including Eberhart, convinced the commission that space should become a top national security priority.

“We’d be kidding ourselves if we said we couldn’t do it better, (and) our goal ought to be to do it better tomorrow,” said Eberhart.

For example, he noted that DoD space specialists could make more effective use of available

communications bandwidth, and become better at processing and disseminating information “to get inside the enemy’s decision-cycle.”

“We gather data,” Eberhart said. “How can we change that data to information which can lead to decisions? That is the real key. We’re working hard, we have some wonderful people out there, and we have a great partnership with industry, with commercial suppliers.”

A Rumsfeld space commission news release called the likelihood of future conflict in space “a virtual certainty.” Because of this, the commission noted, the United States should take immediate steps to develop superior space capabilities.

Some critics say the United States won’t need such enhanced capabilities for 25 years or more, when a peer may arise to challenge America militarily in space. Other critics say there should be no military use of space, but Eberhart believes this has already occurred.

“We have, in fact, militarized space,” he said. “We use space assets, space information for military applications—we’ve been doing that for decades. The trend is increasing, not just the United States of America, but also other countries. Friends—and possible foes.

“So, I think we’ve crossed that bridge,” he concluded. ★

# Rumsfeld Announces Revamping of U.S. Space Program

*Source: American Forces Press Service*

WASHINGTON — Defense Secretary Donald H. Rumsfeld unveiled a major reorganization of the nation's space program May 8, 2001, aimed at protecting U.S. satellites from enemy attack.

The plan would transform the management and organization of America's defense and intelligence space program. It calls for consolidating military space programs under the Air Force and creating a new four-star general position as the chief advocate for space programs.

Air Force headquarters and field commands will be realigned to more effectively organize, train and equip for space operations, Rumsfeld told reporters during a Pentagon press conference. Changes involve the office of the secretary, the military departments, National Reconnaissance Office and the U.S. Space Command.

"A more comprehensive management and organizational approach is necessary to assign clear responsibilities and accountability for national security space programs," said Rumsfeld, who led a congressional commission on space programs before being tapped for the defense secretary job. The commission recommended that DoD enhance military space technology and study ways to project power from space.

Rumsfeld told reporters that the changes "will help the U.S. to focus on meeting the national security space needs of the 21st century."

He said DoD will be looking at about a dozen different things recommended by the Ballistic Missile Defense Organization. "We'll then try to demonstrate them. To the extent they work, terrific, we'll put more money behind them. To the extent they don't, we'll try to find a better way to do these things," he said.

The proposals have nothing to do with militarizing space with such things as satellite-killers and lasers, the secretary emphasized. "These proposals have to do with organizational arrangements with the Department of Defense that put a focus on the important issues relating to space," he added. "A big change here is making the Air Force executive agent for space. It doesn't deny the other services their proper roles."

Reading an excerpt from the Sept. 19, 1996, National Space Policy, still in effect, Rumsfeld said DoD is authorized to develop, operate and maintain space control capabilities to ensure freedom of action in space and to deny freedom of action to adversaries, in accordance to treaty obligations.

U.S. policy has always been to use diplomatic, legal and military

measures to prevent adversaries from using space systems and services, the secretary noted.

The United States is committed to the exploration and use of outer space by all nations for peaceful purposes for the benefit of all humanity and rejects any claims to sovereignty by any nation over outer space, Rumsfeld said. However, he noted that peaceful purposes allow defense and intelligence-related activities in pursuit of national security and other goals.

Pointing out that the ABM Treaty prohibits countries from creating missile defense capabilities, Rumsfeld said President Bush wants to hold discussions on the treaty with the Russians and later with China.

Rumsfeld said space merits a renewed focus because "more than any other country, the United States relies on space for its security and well-being." The nation, he said, needs to ensure that the management and the organization of its national security space program reflect the importance of space today.

"Our daily lives are increasingly tied to space," Rumsfeld noted. He then pointed out that the nation depends on satellite services to homes, schools, businesses and hospitals. Satellites enable global

*continued on page 30*

# A Faudi Filter Success Story

By Dan Lee

A 30,000-barrel batch of JP-8 fuel received into tank number 309 at Texas Eastern's terminal located in Bossier City, La., was handled in the same manner as hundreds of past receipts.

Proper amount of settling time was allowed, sampling containers were soaked and rinsed as usual, sampling procedures were followed, and samples were promptly transported to the lab.

But as B-1 testing progressed, we noticed a very unusual happening while performing the time filtration and particulate contamination test. Fuel flow through the membrane filter had almost completely stopped after approximately 2,000 milliliters (ml). The membrane filter completely stopped fuel flow after 33 minutes and only 2700 ml of product had been filtered. Needless to say, particulate contamination was in the ionosphere. Normal operating procedures followed, i.e., more settling time, re-sampling/testing from top-middle-bottom of tank, retains tested.

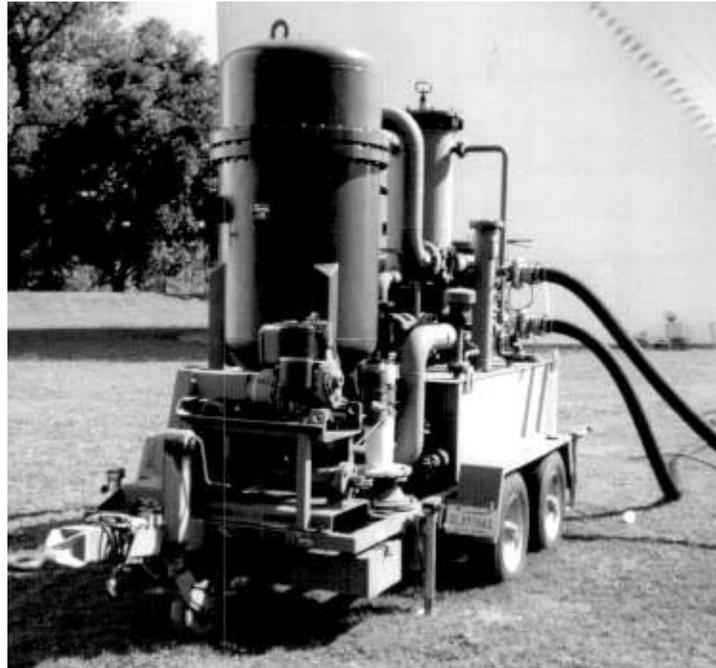
Our efforts proved that we had a sick batch of JP-8 on hand, which created a tremendous problem. Only two tanks are available at the terminal to support Barksdale Air Force Base, one of our biggest users, and one of the tanks couldn't be

used until the sick fuel was doctored. All factors considered, we decided to clean up the fuel—hoping the Faudi filter would be our family doctor.

The filter was transported from Defense Fuel Support Point (DFSP) Charleston, S.C., to Bossier City. Don Matthews and Master Sgt. Shawn Browning, both assigned to DFSP Charleston, arrived at Bossier City a couple of days later to instruct myself, Rodney Lummus, an area manager with Texas Eastern, and the terminal crew on how to operate the system. After a couple of days scurrying around for needed equipment, materials and parts, we connected the Faudi to the terminal manifold system. The connection

allowed us to use the terminal's discharge system to pump fuel out of tank 309 to the inlet of the Faudi system.

First, we tested the Faudi to see if it would doctor the sick fuel. We connected the Faudi discharge line to tank 309's two-inch water drain, the only entrance available. The system was pressurized, the Faudi charged, and a two-hour circulation trial run was conducted. Minor discrepancies were corrected and we took two samples during the trial run—one sample from the Faudi's inlet and one from the discharge line. Test-run inlet sample test results were as bad as before, however, the discharge sample test results were phenomenal. Time = four minutes,



Faudi filter

# Could a filtration system save the government more

P/C = .05. [Quality tests require that fuel travel through the filter within 15 minutes. The particulate/contaminant weight limit is one milligram per liter.] Dr. Faudi is doing his job well.

During the Faudi test run, fuel in tank number 310 could not be transferred to Barksdale AFB because of the required terminal discharge system configuration. Consequently, our “clean-up” operation was on hold for a few days until tank number 310 had sufficient ullage [space] to accept the contents of tank number 309. The down time was used to drop and flush the Faudi system and re-configure its discharge destination. We connected the Faudi discharge line to tank number 310’s two-inch water drain, again, the only entrance available.

By the time we started the actual clean-up operation, we were old hands at operating the Faudi system. We operationally checked the Faudi system every 15 minutes—Rodney’s requirement. His terminal operator performed these checks.

After our initial sample/test met and exceeded our expectations, we sampled/tested every six hours. The Faudi filter pressure gauge was checked and results recorded at the 15-minute check. Time, particulate and pressure increases were

indicators that our medication was getting low and that we must re-charge the filter. Two re-charges were necessary to complete the job. Final sampling/testing on samples taken from tank number 310 proved the operation was a great success.

## What exactly is a Faudi filter?

Faudi is a German manufacturer of a filtration system designed to clean contaminants from fossil fuels. How does it work? The huge filter housing contains several elements called “candles.” A clay-like powdery substance we’ll call “earth” is placed in a canister that is pipe-connected to the filter housing. When pressure is applied, the earth is forced into the filter housing, coating the candles. We call this operation “charging the filter.” The coating creates a magnetic field that attracts stuff that’s not supposed to be in the fuel. Contaminants are caught and not allowed to exit the filtration system—only clean fuel can exit. Filter efficiency declines when the candles and earth get too saturated with contaminants. Re-charging the filter is necessary when this happens. To re-charge after an operation is started, the flow of the fuel must be stopped and the filter pressure released. This causes the earth and contaminants to drop from the candles into the bottom of the filter housing and onto a holding tank. The candles are then recharged with earth and the process continues until all of the fuel is filtered.

The clean-up operation took much less time than expected, thanks to the superior performance of Texas Eastern’s Bossier City crew and management: Rodney Lummus, area manager, and Johnny Bagley, area supervisor, as well as operators Leon Boykins, David Roe, Steve Dickson, Doug Irby, Jim

Sharp, Bobby Cole, Bobby Machecha and Patrick Lawrence. Special thanks to Don Matthews and Master Sgt. Shawn Browning from DFSP Charleston for their support in teaching us how to operate the Faudi filter. Their efforts, traveling to and from Bossier City and helping with the first run, were valuable assets in our overall success.

The clean-up operation took just over two days to complete. On the third day, we obtained an all-level sample from tank number 310, had it analyzed, and were supplying on-specification JP-8 to our customer by mid-afternoon.

Had the Faudi failed, pipeline support to our customer would have been cut in half. Also, an alternate re-supply would have been necessary. Neither happened because of the success of the Faudi filter.

If we had not been able to doctor the fuel, we would have had the following expenditures: lost money for unusable JP-8, downgrading the fuel (removing it from inventory), purchasing an

alternate supply of fuel for our customer, and a tremendous number of manhours. I estimate that the Faudi filter saved us well over a million dollars.★

*Dan Lee is a quality surveillance representative with Defense Energy Support Center-Houston, stationed in Louisiana.*

than a million dollars by doctoring a batch of sick fuel?

communications, television broadcasts, weather forecasting, navigation of ships, planes, trucks, cars, synchronizing computers, communications and electric power grids.

“Satellites are also our worldwide eyes and ears,” because, Rumsfeld said, “they collect information on capabilities and intentions of potential adversaries, monitor treaties and agreements and support military operations worldwide.

“Our dependence on operations in space, however, makes us somewhat vulnerable to new challenges,” Rumsfeld noted. Consequently, he said, the United States must be attentive to these vulnerabilities and pay careful attention to protecting and promoting its interest in space.

Instead of gearing up to prevail in a conflict, the United States is beefing up its space program to deter conflict by dissuading others from engaging in acts hostile to the nation’s national security interests, Rumsfeld said.

“People think, ‘My goodness, they obviously have something in their heads that’s all firm and all fixed, and they’re going to suddenly pull open the curtain and there it is.’ Not true,” Rumsfeld said. “These consultations are serious. This is a big, important issue for people to discuss. It’s going to take some relearning; it’s going to take a willingness on the part of people to recognize the difference in our circumstance today from what the circumstance was in the Cold War, and we’re going to do that, and we’re going to do it well.”★

## DoD Mobilizes to Mitigate California Power Shortage

Source: *American Forces Press Service*

WASHINGTON—Defense Secretary Donald H. Rumsfeld announced plans May 3, 2001, to cut DoD’s peak power usage in California to help mitigate that state’s growing energy shortage.

Rumsfeld directed DoD installations in California to decrease their peak power draw from state commercial electricity grids through conservation, energy efficiency investments and power generation, department officials said.

The secretary’s actions follow initiatives announced earlier by President Bush to involve federal organizations in assisting California’s search for more electric power.

“The situation in California and the surrounding states demands the full attention of all electricity consumers, public and private,” Rumsfeld said. “We intend to do our part to mitigate the electricity shortage.” He noted DoD is one of California’s larger consumers of electricity even though its draw represents only 1 percent of the state’s peak load.

Rumsfeld said he wants DoD’s peak-hour electricity consumption in California this summer reduced by 10 percent from a year ago and by another average 15 percent by summer 2002.

The Defense Department will invest more than \$50 million over the next two years as part of energy-saving initiatives in California, Ray DuBois, deputy undersecretary of defense for installations and environment, said at a May 3

Pentagon press briefing. The investment will leverage over \$290 million in private-sector spending on energy-saving projects in the state, he said.

Deputy Defense Secretary Paul Wolfowitz remarked May 3 at the White House that DoD’s conservation efforts in California would essentially provide the state with the energy equivalent of a 200-megawatt power plant.

DuBois said electricity generation at two DoD-operated natural gas power plants in California would be stepped up, pending state approval, to help alleviate the state’s power shortage. DoD-owned diesel mobile power generators in the state, however, won’t be used to provide more power, he added.

DoD’s efforts in California, he added, would eventually bring \$25 million in annual savings, which will be used for energy programs, and housing and quality of life projects.

Rumsfeld noted the Defense Department has achieved considerable energy savings over the years, having decreased energy consumed per square foot in its buildings nationwide by 23 percent since 1985.

“This success story, however, makes the new power reduction initiative all the more difficult, since the less difficult solutions have been implemented already,” he said. “The services will need to be more innovative, aggressive and tenacious to meet our goals in California.”★

# A Short History of DESC's Employee Communications Council

During a 1997 meeting of the Defense Energy Support Center's Executive Council, a discussion of the need to improve internal communication gave rise to a "process action team." Led by Kathy Williams, associate director of the agency's Small Business Office, the team surveyed DESC employees in order to identify communication problems and possible remedies.

How might information be better disseminated between employees, within departments, within the Center as a whole, and from supervisors and management to the general work force? After initial findings were reported to DESC's Executive Council, the team evolved into a permanent body known as the Employee Communications Council,

whose volunteer members represent the interests and concerns of employees throughout the DESC work force.

The ECC remains a "work in progress," that is, they continue to find ways to improve employee satisfaction and foster a more positive corporate climate. While the original team's mission was limited to communication issues only, the ECC has expanded its scope to include diversity concerns as well—an area closely aligned with the Council's original charter, or as ECC member Jim Smith observes, "recognition of diversity enhances communication."

"Our main responsibility is to the Executive Council and the work force," says Ms. Williams, who adds

that the ECC could use more members to more accurately represent the concerns of DESC employees.

"I see the ECC as a valuable tool in the communications plan for DESC...continually assessing and pulsing the work force for valuable input," says DESC Deputy Director Capt. Stuart Funk, SC, USN. "The ECC has direct access to the director and deputy director for matters relating to the health of this organization, and we will be working to utilize that communication channel more in the future, 'up' as well as 'down' the chain."

For information on the ECC, contact Ms. Williams at 703-767-9465.

## DLA Launches 'Today & Tomorrow' Intranet

The Defense Logistics Agency recently launched an intranet site designed to keep employees informed of defense news from a variety of national sources in addition to developments at DLA's headquarters and primary field level activities. Updated daily, the site also contains links to various news outlets and a detailed DLA schedule of events. The DLA "Today & Tomorrow" site may be accessed through DLA's home page at [www.dla.mil](http://www.dla.mil) or directly at <http://today.dla.mil>.



# Biometrics to Aid DoD Security Drive

Source: *American Forces Press Service*

WASHINGTON—James Bond gained access to Q’s sensitive offices by putting his palm to a reader. A sexy voice said, “Hello, Commander Bond,” and the door opened.

You never saw James Bond trying to remember a password. And if DoD’s biometrics research effort works, you won’t have to anymore either.

Biometrics is the overall name for security technologies that measure a person’s physical characteristics and then allows them access. Biometrics works via fingerprints, iris scans, retina scans, the shape of your face, voice prints and so on. The DoD Biometrics Management Office is charged with bringing this technology to the department.

The bottom line is security.

“If we look at the way hackers are penetrating our systems we find that it’s usually password-related — bad password management, bad passwords in that they are easy to crack or, perhaps in some cases, no passwords at all,” said Philip Loranger, head of the office. “If we make security easier to the users, which is the intent behind biometrics, then those things go away.

“This technology can be a picture of your face, your fingerprint or your voice to allow you to enter a system,”

he continued. “Therefore it’s not required to write down your password and put it into your wallet.”

The office has two pilot projects. One is with the West Virginia National Guard and tests how the program works with information technology. The other is with Army Materiel Command and deals with physical security.

The services, too, have biometric efforts. The Army Lab Command in Adelphi, Md., is studying ways to control access into all DoD labs. The lab is looking at iris recognition and facial recognition, said project manager Hal Harrelson, an engineer at the lab.

“We’ve just finished a six-month test of iris recognition, and we’ll start the facial recognition test in July,” Harrelson said.

Iris recognition works by taking a picture of a person’s eye and comparing it against a picture taken earlier. “It’s highly reliable,” he said. Face recognition works much the same way, Harrelson said.

He said there are two mistakes any system would make: letting in unauthorized persons or keeping out authorized persons. “In the test, it may have let in one unauthorized person,” Harrelson said. “It did keep



out authorized personnel. It cost them another five seconds to try the recognition system a second time. This happened once out of every 20 times.”

DoD may use these technologies not only in information technology systems, but in weapon platforms and weapon systems, Loranger said. “Imagine ... biometric access to the motor pool and motor park,” he said. “These things are all doable. It’s a matter of lining up the infrastructure to start implementing that.”

The DoD office partners with industry, but there are some unique aspects to the military. “The commercial world is not too interested in whether the presenter is alive or dead,” Loranger said. “The last thing we want is to field a technology that would harm a warfighter, such as cause fingers to be cut off and presented as an access mechanism.” The DoD office is working with vendors to ensure there is a “liveness” test with biometrics.

The DoD Biometrics Office has a budget of around \$25 million. ★