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Military Plans Tests in Search for an Alternative to Oil-Based Fuel

By THOM SHANKER MAY 14, 2006

WASHINGTON, May 13 — When an F-16 lights up its afterburners, it consumes nearly 28 gallons of fuel per minute. No wonder, then, that of all the fuel the United States government uses each year, the Air Force accounts for more than half. The Air Force may not be in any danger of suffering inconveniences from scarce or expensive fuel, but it has begun looking for a way to power its jets on something besides conventional fuel.

In a series of tests — first on engines mounted on blocks and then with B-52's in flight — the Air Force will try to prove that the American military can fly its aircraft by blending traditional crude-oil-based jet fuel with a synthetic liquid made first from natural gas and, eventually, from coal, which is plentiful and cheaper.

While the military has been a leader in adopting some technologies — light but strong metals, radar-evading stealth designs and fire-retardant flight suits, for example — any effort to hit a miles-per-gallon fuel efficiency rating has taken a back seat when the mission is to haul bombs farther and faster or push 70-ton tanks across a desert to topple an adversary. (The Abrams tank, for example, gets less than a mile per gallon under certain combat conditions.)

"Energy is a national security issue," said Michael A. Aimone, the Air Force assistant deputy chief of staff for logistics.

The United States is unlikely ever to become fully independent of foreign oil, Mr. Aimone said, but the intent of the Air Force project is "to develop enough independence to have assured domestic supplies for aviation purposes."

By late this summer, on the hard lake beds of the Mojave Desert, where the Air Force tests its most secret and high-performance aircraft, a lumbering B-52 is scheduled to take off in an experiment in which two of the giant bomber's engines will burn jet fuel produced not from crude oil but from natural gas. The plane's six other engines will burn traditional jet fuel — just in case.

The Air Force consumed 3.2 billion gallons of aviation fuel in fiscal year 2005, which was 52.5 percent of all fossil fuel used by the government, Pentagon statistics show. The total Air Force bill for jet fuel last year topped $4.7 billion.

Although the share of national energy consumption by the federal government and the military is just 1.7 percent, every increase of $10 per barrel of oil drives up Air Force fuel costs by $600 million per year.

Mr. Aimone said that if the synthetic blend worked, plans called for increasing its use in Air Force planes to 100 million gallons in the next two years.

Air Force and industry officials say that oil prices above $40 to $45 per barrel make a blend with synthetic fuels a cost-effective alternative to oil-based jet fuel.

Fuel costs have doubled since the attacks of Sept. 11, 2001, and crude oil prices since Hurricane Katrina have remained above $60 a barrel.

The Air Force effort falls under a directive from Defense Secretary Donald H. Rumsfeld to explore alternative fuel sources. Under the plan, the Air Force has been authorized to buy 100,000 gallons of synthetic fuel.

Ground experiments are scheduled to begin in coming weeks at Wright-Patterson Air Force Base in Ohio, followed by test flights at Edwards Air Force Base in California.

Although the Air Force is leading the project, it is working with the Automotive Tank Command of the Army, in Detroit, and the Naval Fuels Laboratory, at Patuxent River, Md.

The research and tests on synthetic fuel would ultimately produce a common fuel for the entire military, Air Force officials said.

The initial contract for unconventional fuel for the tests will be signed with Syntroleum Corporation of Tulsa, Okla., which has provided synthetic fuel for testing by the Departments of Energy, Transportation and Defense since 1998.

John B. Holmes Jr., Syntroleum's president and chief executive officer, said his firm would sell the Air Force its synthetic fuel for testing "at our cost, and we may be losing a little bit."

Neither Mr. Holmes nor the Air Force would provide cost estimates for the experimental fuel deal in advance of signing a final contract, expected in coming days.

Air Force officials have acknowledged, however, that the cost per gallon of the test fuel will be expensive.

Syntroleum can produce 42 gallons of synthetic fuel from 10,000 cubic feet of natural gas. The raw materials cost about $70.

If the military moves ahead with using the synthetic fuels, the Syntroleum technology could be used by factories elsewhere to produce the same 42 gallons of fuel from just $10 worth of coal, Mr. Holmes said.

"The United States is essentially the Saudi Arabia of coal," Mr. Holmes said. "It can be mined relatively inexpensively. We really believe that one of the things we can do to help our country's energy needs is to use the abundance of coal reserves."

Mr. Aimone said the large plants needed to produce nonconventional fuels did not exist and would have to be designed and built by the industry.

But he added: "We believe there are economic incentives as we invest in this, and invest with the industry at large, because there are vast coal reserves in this country. The economic pressures of rising oil prices can be moderated by the price of coal."

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