



Short But Sweet

U.S. Air Force completes B-52 test cycle

JAMES OTT/EDWARDS AFB, CALIF.

A blend of synthetic kerosene and JP-8 burns in PW TF33 engines 7 and 8, leaving a slightly reduced trail of black smoke.

The U.S. Air Force is moving slowly but surely toward the goal of certifying a synthetic kerosene while domestic producers of alternative fuels and potential commercial users wait for concrete developments.

Initial flight tests over a 10-day period in a B-52 Stratofortress, using a blend of synthetic and JP-8 fuels in a two-engine pod, demonstrated that the blend is working, says Jerold C. Smith, chief engineer with the Oklahoma City Air Logistics Center. Analysts are going over performance data, and the next step will determine what it will take to fully qualify the blend. He says it's likely a series of ground tests will precede using the blend as fuel in all eight B-52 engines.

IN THE FIRST TEST SEPT. 19, the bomber launched from a Flight Test Center runway here and passed over a gathering of government and industry officials. Test engines 7 and 8 left a good impression—a somewhat reduced trail of black smoke compared to longer and wider streams from the six JP-8-fueled engines.

Air Force Under Secretary Ronald M. Sega, a retired major general and former Air Force pilot, flew on the test mission. Though that flight was cut short because a wingtip landing gear failed to retract properly, Sega said the two TF33 engines fueled with the blend, “worked like the other engines using JP-8.” Flights on Sept. 27 and 29 completed the initial test cycle.

Ground tests of the synthetic kerosene-JP-8 blend indicate that it burns at about the same rate as petroleum-based fuel, says William E. Harrison, 3rd, chief of the fuels branch at the Air Force Research Laboratory at Wright-Patterson AFB, Ohio. Tests also have demonstrated the advantage of a 20-40% reduction in particulates. Harrison says no leakage was found in the test engines. This was expected, but is still a concern

since the synthetic contains no aromatics, which cause O-rings and gaskets to swell and prevent leaks. Pre-flight tests indicated that by mixing JP-8 with the synthetic kerosene, the blended fuel had the right properties for proper sealing.

Syntroleum Corp. of Tulsa, Okla., provided 100,000 gal. of the synthetic kerosene. It was produced from natural gas using the Fischer-Tropsch process developed in Germany in the 1920s, but it can be made from coal as well. Syntroleum also provided diesel fuel the Air Force is using in ground vehicle tests at Edwards AFB and Selfridge Air National Guard base in Michigan.

Syntroleum has “mothballed” its demonstration plant, according to a company official. The plant, capable of producing 70 barrels a day, costs \$1 million a month to operate. Syntroleum is looking for business and will reopen the refinery when new contracts are obtained.

Representatives of three U.S. users of the Fischer-Tropsch process attended the initial Air Force test flight and eagerly await the results. In addition to Syntroleum's Chairman Kenneth L. Agee, there was D. Hunt Ramsbottom, president and CEO of Rentech of Denver, and John W. Rich, Jr., president of WMPI Pty. of Frackville, Pa. Each company is looking to develop aviation synthetics to complement their offerings.

Harrison says the drive to find alternative and improved fuels has picked up steam with rising concerns over the price of petroleum-based fuels, dependence on foreign sources for oil and interest in conservation (*AW&ST* July 31, p. 54). Synthetic kerosene has been the Air Force's chief focus in part because it appears to be transparent to engines built for petroleum-based fuels. Furthermore, there are large stores of natural gas and coal in North America.

Interested in the potential of a 200-

million-gallon purchase by the Air Force and the Navy in 2008, 25 companies responded to a request for information on synthetics.

The Air Force has adopted a systems engineering approach to determine the impact of synthetic kerosene on aircraft and engines. A similar synthetic, produced from coal by Sasol Ltd. of Johannesburg, South Africa, has been fueling commercial aircraft at Johannesburg since 1999 was approved by the U.K. Defense Ministry as Def Stan 91-91.

Success of the drive for alternative fuel will depend on purchase contracts, one industry official says. A roadblock to large government buys is a requirement that fuel be acquired for a fiscal year. If Congress would permit Defense Dept. contracts for much longer periods, the chance of Wall Street financing new refineries would be improved greatly, according to a government official.

Interest in synthetic fuels is broadening into the commercial sector, says Paul P. Bollinger, Jr., special assistant to the assistant secretary of the Air Force Installations, Environment and Logistics. The FAA and Georgia Tech are co-hosting a workshop Oct. 23-24 in Atlanta for industry personnel to explore economic and environment factors of a shift to alternative fuels.

DESPITE ENVIRONMENTAL advantages of the synthetic fuels, Steve Bergin, program manager for advanced vehicle technologies with ICRC of Sterling Heights, Mich., anticipates a backlash from activists who “want zero emissions. I'm pleased the Fischer-Tropsch utilization is moving forward, but it's going to be a tough sell.”

Edwards' Test Center commander Maj. Gen. Curtis M. Bedke says the test program is “creating options for the Air Force If this doesn't work, we will continue to look for alternatives.”