

Technology Notes

ENERGY

Sun and Wind Power

Solar radiation and wind could be highly practical energy sources for developing countries if they could be stored conveniently, according to Kenneth A. McCollum, professor of electrical engineering at Oklahoma State University.

One method of temporary storage could be as hydrogen gas, he says. Electrical energy produced by sun or wind could be used to electrolyze water to form hydrogen and oxygen gases. The hydrogen energy could later be reconverted to electrical, mechanical, or heat energy.

"Solar radiation and wind energy are promising unconventional energy sources," McCollum says, "since they are found reasonably well distributed over the earth.

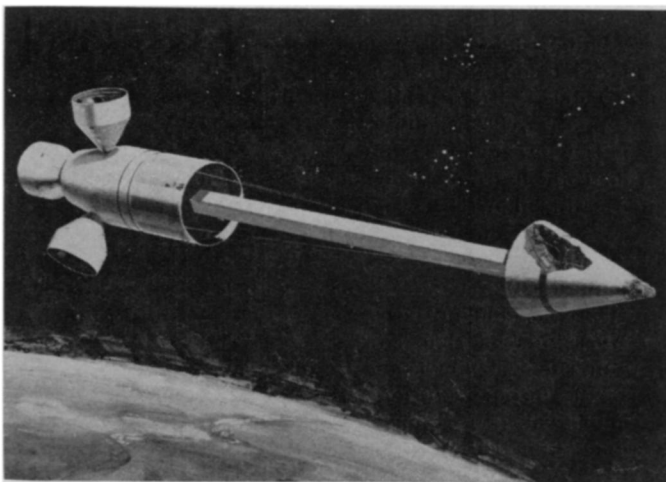
"Unconventional energy generators in small power units, say of one to 40 kilowatts, can cost considerably less to operate than conventional fossil-fueled plants."

POWER ENGINEERING

Nuclear-Powered Space Laboratory

Nuclear energy units can safely supply electric power for up to five years for large manned space labs on long range missions, a 14-month study shows.

The system could consist of a nuclear plant on the end of a 125-foot boom extending away from the space



lab, according to two Douglas Aircraft engineers, Robert L. Gervais and Vern D. Kirkland. With nuclear power systems now being developed, it could provide 30 kilowatts or more of electric power in the post-1975 period.

Crews of 12 men working in the lab would be protected from excessive radiation by a shield about six feet wide. From the end of the boom, the shield would throw a "shadow" of radiation protection about 80 feet in diameter around the laboratory. The protected region would be wide enough to permit earth supply craft to make contact safely and also allow suited astronauts to work safely outside the laboratory.

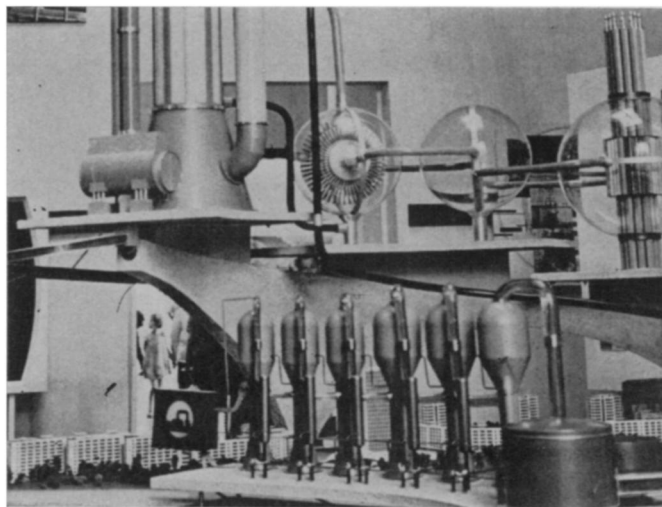
The nuclear power system would be easily replaceable in orbit—somewhat like a flashlight battery. The normal service life of the system would be about two and a half years, with a replacement running an equal time to complete a five-year orbital mission.

DESALINATION

Russians Building Fast Reactor

An experimental fast-neutron reactor, the first of its kind to be built in Russia, is going up on the shore of the Caspian Sea as a combined power-desalination plant. It is designed to put out 350 megawatts of electric power.

Site of the new plant is the Mangyshlak Peninsula,



where large oil and natural gas finds have been made recently. The area lacks water to support the growing population attracted by the finds.

Fast neutron reactors make more efficient use of nuclear fuel—uranium and plutonium—than do reactors where the neutrons are slowed down by a moderator. But they also present radiation problems within the reactor that are more difficult to solve. Fast reactor research is being pushed hard here and abroad.

AERONAUTICS

Jets Take Off Quicker

A unique rotating cylinder built onto an airplane wing can increase lift at takeoff by about 50 percent, tests at Ames Research Center, Moffett Field, Calif., show.

Purpose of the research is to cut down the distance it takes for big, heavy jet planes to get off the ground. The bigger planes get, the longer runways must be. The work at Ames, a branch of the National Aeronautics and Space Administration, involves converting into lift capacity some of the enormous initial power required by planes to reach takeoff speed. The cylinder on the leading edge of the plane's wing flaps does this, say NASA officials.