

Test tunnel for tomorrow's telescopes

With growing numbers of satellites, balloons and other systems being devoted to X-ray astronomy, a huge test facility more than three times the length of a football field is about to be built by NASA to develop and test advanced X-ray sensors for future missions.

To be constructed at the Marshall Space Flight Center in Huntsville, Ala., the facility will consist basically of a 305-meter-long tube, with chambers for an X-ray source at one end and for telescopes and other instruments being tested at the other. Air pressure in the instrument chamber and the connecting guide tube will be reduced to the equivalent of that found about 200 kilometers above the earth; the X-ray source will be at the equivalent of 320 kilometers' altitude.

Because the optical systems under test will be extremely sensitive to contamination, even the intake lines for the vacuum pumps will be filtered with cryogenically cooled baffles, to keep particles from the hydrocarbons used in the diffusion pumping process from migrating back to mirror surfaces and other components.

One of the first uses of the facility will be to test telescopes and other instruments for the HEAO High-Energy Astronomy Observatory satellite series. The first HEAO is scheduled to be launched in 1977.

Iran lends ERTS an ear

A ground station about to be built by the Iranian government to receive data directly from earth resources satellites will also be available to aid NASA with data collection in case the satellites should malfunction. If, for example, there should be a breakdown of the satellites' tape recorders, which normally store data until they can be "dumped" over regular NASA stations, cooperative stations such as Iran's can be asked to provide copies of the data that are transmitted "live."

The Iranian station, to be built in the Tehran area, will be only the fourth foreign installation for earth resources data. Currently operating foreign stations are at Prince Albert, Canada, and Cuiaba, Brazil. A third being built at Fucino, Italy, is expected to begin full operations by the middle of next year.

NASA has guaranteed Iran free access to the ERTS-1 satellite, which is still operating after 28 months in orbit, and to the first operating year of ERTS-2, now set for launch next Jan. 16. Beyond that time, NASA has the option of setting up cost-sharing with the foreign stations.

Planned schizophrenia for industry

The commercial aircraft engine industry is likely to see an increase in the number of international, cooperatively developed projects, says one company executive, simply because the required resources are becoming so great that no single company can hope to design, develop and market a new commercial engine on its own.

"The trick is to learn to live with planned schizophrenia," says Brian H. Rowe, vice president and general manager of General Electric's Airline Programs Division, "... where another firm can be a competitor, a co-producer, a licensee, a licensor, a buyer and a supplier all at the same time." Rowe bases GE's multinational plans on the success of military programs such as the J79 engine for the Starfighter, which was built with components from Belgium, West Germany, Italy, the Netherlands, Canada and Japan.

The cost of sprawl

The unsightliness of urban sprawl is evident; many-hidden costs are not. A new report, *The Costs of Sprawl*, prepared by the Real Estate Research Corp. for several interested Government agencies, assesses some of these hidden expenses and compares the social and environmental effects of various kinds of urban development.

At first glance, the benefits of high-rise living seem impressive. For a given population and land area, maximum density housing in a planned community could save 44 percent of the total investment costs, compared with random, single-unit housing sprawl. It would leave more land free for recreation, produce 45 percent less air pollution (less energy required) and result in fewer traffic accidents.

However, crime is likely to be 20 percent higher, and unless special sound absorbers (like trees) are used, the denser housing community is likely to be noisier. Also, there's a catch—strict land-use planning is needed to keep new population from filling in all that free land. The authors of the report draw no conclusions as to when high-rise living is best, but their message is clear to the city planner they hope will utilize the study: plan ahead.

Criticism of Rasmussen report

When the Atomic Energy Commission finally released a study of reactor safety compiled by nuclear engineer Norman C. Rasmussen and some 60 other scientists (SN: 8/31/74, p. 117), no one was terribly surprised that the new figures showed nuclear energy to be much safer than in an earlier AEC estimate, which had proved a fertile ground for environmentalist critics. Just as predictably, environmentalists are now attacking the new report as unrealistic.

One detailed attack, by Bob Augustine of National Intervenors, appears in the Oct. 12 ENVIRONMENTAL ACTION. Augustine calls the Rasmussen report "no more than an academic mathematical exercise. It has no bearing on the real risk of a reactor accident."

The ultimate weakness of the study, Augustine contends, is its failure to properly assess human error. For example, in the AEC report, the chances of fuel core meltdown is said to be one in 17 million. But that figure requires the reactor operator to think quickly enough to follow the right emergency procedures in the event of coolant loss. Such quick reactions are unlikely, Augustine believes. He pegs the actual risk of meltdown at one in 17,000.

He also knocks inconsistencies between the report and related Government policies. Though the report says an accident at a 150-megawatt reactor could cause \$1.7 billion damage, legislation before the Congress to cover such eventualities only provides \$560 million of insurance. And while the Rasmussen report estimates that 90 percent of people around a reactor would be safely evacuated in event of an accident, Augustine says, in fact, few preparations for such evacuation have been made.

The argument over numbers is likely to continue; but debate itself may arouse public consciousness on the need to provide consistent protection against nuclear hazard—including adequate insurance and evacuation procedures.

Nutritious plastics

Rutgers University chemist J. R. Giacini has developed what he says is a biodegradable resin for food packages that would actually be nutritious for plants if thrown away. He has been fertilizing some oats with the new plastic.