

Paying for power, warheads

The beginning of an advanced power reactor and the end of a major accelerator are the main features of the Atomic Energy Commission's 1971 budget. But there are many ups and downs for various projects.

The overall AEC budget request for fiscal 1971 is \$139 million higher than the previous year, increasing to \$2.36 billion.

The increases, however, are not entirely evenly distributed, and will not all be felt during the next money year, inasmuch as the AEC plans actual expenditures during fiscal 1971 of only \$2.41 billion, off some \$50 million from this year's outlays.

Within that reduced sum there is some shuffling of funds. Such projects as the 200-billion-electron-volt accelerator at Batavia, Ill., and the fast breeder development program will get some increases, while most other civilian programs are being trimmed to find money for higher priority weapons-development programs.

The key to AEC directions, however, is in the authority it is requesting to spend money in areas in which the big bills will come farther in the future. Here lies a key escalation.

Part of the increase goes to the development of civilian nuclear power. A major item is directed toward the agency's favorite power prospect for the next generation of nuclear reactors, the liquid metal (sodium-cooled) fast breeder. The budget contains \$32 million in long-term authority to build a demonstration breeder, in cooperation with a private contractor not yet chosen (SN: 12/13, p. 551). Only \$4 million is to be spent in fiscal 1971, however. In addition, the budget provides \$85 million for the entire liquid metal breeder project, including R&D funds, an increase of \$2.3 million over 1970.

As attention continues to concentrate on the sodium breeder concept, other projects fall out. Two casualties this year are the Ultra High Temperature Reactor experiment at Los Alamos, which was funded at \$1.8 million last year, and the gas-cooled fast breeder concept, which received \$1.5 million in fiscal 1970. Both projects have been eliminated from the present budget request. On the other hand, the Light Water Breeder Reactor, Adm. Hyman Rickover's project at Shippingport, Pa., receives a healthy \$8.4 million boost to \$24 million. The molten salt breeder concept, which uses thorium and a unique form of fuel utilization that allows for easy refueling of the reactor, continues at a sustaining \$5 million level, the same as last year's.

Physical research projects are receiving the same selective gains or losses accorded the nuclear power program for 1971. Most significant is a reduction of \$2 million in funding for the Princeton-Pennsylvania accelerator, the first step in a planned closedown of that facility. The Cambridge Electron Accelerator is also due for reduced funding from \$3.5 million in 1970 to \$2.4 million in 1971.

On the other hand, the 200 GeV accelerator now building at Batavia, Ill., received an increase of \$2.8 million in operating funds, as well as \$65 million in construction money already authorized. Another authorized project, the meson physics facility at Los Alamos, received \$10.5 million in construction money and a slight increase in operating money. And the controlled fusion project, which was showing promise during 1969, received a boost of about \$2 million to \$29.6 million, with concentration on the approach developed by Russian scientists at their facility called Tokamak (SN: 1/8/69, p. 424). The total physical research budget, however, shows a cut of almost \$4 million.

The biology and medicine budget also received a small cut, although AEC officials point out that research on radiation effects on the environment, in line with the Administration's concern with the quality of life, was increased slightly to \$71.1 million, and research on thermal effects of nuclear power plants has been raised from \$1.7 million last year to \$3.2 million in fiscal 1971.

The budget and environmental concern have combined to deal a heavy blow to the Plowshare Program for developing peaceful uses of nuclear explosions. Although the problem of contamination from nuclear excavation projects is controversial, the issue is apparently touchy enough in the present environment-conscious atmosphere to call a halt to such experiments. The decision, based on a combination of environmental concern and budget stringency, according to AEC officials, comes at an inconvenient time for the commission studying a nuclear-blasted, sea-level Central American canal, which must make its report this December on the project's feasibility and on a recommended route (SN: 1/24, p. 89). The commission has said that it needs one or two more excavation tests, in addition to one 200-kiloton point charge scheduled for some time in the next few months, to come to a firm conclusion on the project, but it won't get them in time for the report: No excavation experiments are included in the 1971 budget.

Underground experiments fare somewhat better in the 1971 budget, with

\$2.7 million compared with \$1.5 million last year. But the total Plowshare request is down from \$14.5 million in 1970 to \$8 million in 1971.

The NERVA nuclear rocket and its associated program also took a small \$3 million cut to \$43 million, which, combined with similar cuts in the National Aeronautics and Space Administration's share of the project, will cause the flight date of the rocket to slip about six months into 1978.

Military appropriations have met few of the difficulties encountered by civilian projects. The procurement of nuclear raw material—uranium ore—is scheduled to end in December, 1970, which shows as a substantial cut in that program from \$50.8 million to \$18.0 million; future needs for uranium for weapons will be supplied by recycling material from obsolete warheads, and uranium for power reactors will be bought by electric utilities and merely enriched, for a charge, by the AEC. However, the 1971 budget includes an increase of \$36 million for nuclear weapons, to \$842 million, while naval propulsion reactor development is funded at a level \$132 million, \$11 million higher than fiscal 1970.

DEFENSE

Holding the development line

Picking up where Congress left off, President Nixon has taken another slice out of the Defense Department budget. At the end of last year, the House lopped off \$5.3 billion (SN: 12/13, p. 550). The latest fiscal surgery has cut it to \$71.8 billion, giving Defense the smallest percentage of any Federal budget proposal since 1950.

Relatively, the effect on the Pentagon's research development, test and evaluation program is negligible. For example, DOD's RDT&E budget is about \$7.3 billion, or approximately the same as it has been for the last two years. Taking just R&D, the amount is \$5.4 billion, an increase of \$600 million over 1970.

There appears to have been an effort to protect some development programs, and the Defense Department's RDT&E program will hold the line in 1971, provided Congress does not do some scissor work of its own. However, it should be noted that at this time last year, Defense was asking for \$8.2 billion, and some officials regard the \$7.3 billion figure as a 12.5 percent cutback. The end of the Manned Orbiting Laboratory program (SN: 6/21, p. 595), for example, represents a cutback, but does not hurt any other programs.

As one Defense official put it, "It's a little leaner than last year, but it's not disastrously thin."

RDT&E will generally hold steady, with about \$1.5 billion going for research and about \$6 billion going for development, test and evaluation. Basic research, however, which totaled \$369 million in the 1970 budget, is slipping. If it continues the same trend as seen in the 1969 and 1970 budgets, then it can expect a 10 to 15 percent cut in this budget.

The criterion for cutting basic research projects—in fact, all research—is the Mansfield amendment (Sen. Mike Mansfield, D-Mont.), which decreed that all DOD research projects must show a direct and apparent relationship to military applications. The amendment pertained to the 1970 budget, “but the wording will carry over and all future programs will be judged by that,” says one official. “We take it as a signal that that’s what Congress intends DOD to do.”

One research program that apparently meets the Mansfield criterion, but which has disappeared as a line item in Defense’s 1971 budget anyway, is Project Themis. This was an attempt to create new “centers of excellence” in universities by financing 118 defense-related projects.

“Project Themis efforts will be incorporated in the three service’s regular research programs,” points out one spokesman. “We hesitate to say Themis is dead altogether.”

But the Nixon budget has energized another program: Safeguard. After narrowly escaping death in the Senate (SN: 8/16, p. 127), Mr. Nixon’s anti-ballistic missile system is alive and well in the 1971 budget, with \$1.5 billion, an increase of \$598 million over 1970.

In fact, President Nixon wants to expand it beyond the original schedule. As originally outlined, the Safeguard plan called for initial deployment at two sites, in Montana and North Dakota, by 1974. Ten others would be completed by the late 70’s. Now Mr. Nixon wants to use the additional funds to start deployment at some of the other sites.

Joining Safeguard on the upswing are such projects as the AWACS (Airborne Warning Alert Command System), a flying radar station to warn of a missile attack, and the F-14 fighter-bomber.

But apparently a trend has been established, for as Presidential Science Adviser Dr. Lee A. DuBridge speculated, “I think there will be possibly further declines in DOD.”

SPACE

Down in the valley

Last summer the Environmental Science Services Administration, unused to the huge, monolithic projects that

typify the National Aeronautics and Space Administration’s activities, had to turn to the space agency for help in processing the data from the Barbados Oceanographic and Meteorological Experiment (SN: 4/26, p. 411). To do the job, ESSA borrowed the elaborate computer complex at NASA’s Mississippi Test Facility.

At the time, it was a simple case of Government agencies working together on a big research project. Now, however, NASA is finding the existence of such outside efforts to be a potentially life-or-death matter for some of its major field centers, whose developmental roles in the Apollo program are largely behind them.

One such center is the very MTF that has already helped with BOMEX. Another is the nearby Michoud Assembly Facility in New Orleans. The Electronics Research Center in Cambridge, Mass., is to be closed down by this summer, and NASA is frantically looking for outside users in search of big facilities to keep the critical list from becoming a body count.

The disease, of course, is financial malnutrition. With Apollo over the hill and national space goals denounced in favor of broader programs, the fiscal 1971 budget is a downbeat introduction to the new decade.

For every dollar given to NASA by Congress in fiscal 1970, the administration is asking less than 88 cents in the new budget. In working out his budget proposal with the space agency, President Nixon first asked that expenses be kept to a minimum, then emphasized the demand more strongly, and at last, only a week before the budget was submitted to Congress, added a “final turn of the screw.” The result, even before cost-cutters on Capitol Hill get a crack at it, is the lowest NASA budget since fiscal 1962, with a requested total of \$3.33 billion.

The major cut comes from the diminishing Apollo program, dropping from \$2.03 billion to \$1.69 billion to less than \$960 million in two years. A wide range of smaller savings result from postponing a variety of smaller, upcoming programs for a year or so beyond their previous target dates. A pair of Interplanetary Monitoring Probes, for example, scheduled for launch in 1971 and 1972, have been moved to 1972 and 1973. Similar slow-downs have been applied to the Applications Technology Satellites, the International (with Canada) Satellites for Ionospheric Studies and others. In general, the budget follows, though at a slightly slower pace, the middle option of the three offered by the administration’s Space Task Group, which was headed by Vice President Agnew.

Even the agency’s biggest new pro-

grams, however, are getting off at a restrained pace. For the planned large, orbiting space station and the shuttle vehicle that will service it, the budget asks \$110 million. To achieve NASA’s goal of having both operational by 1977, says administrator Dr. Thomas Paine, would have required \$250 million or more in fiscal 1971.

The Apollo Applications Program has also been delayed from three to six months past its former target date of July 1971, though at \$364 million it is still the largest single item in the NASA request except for the Apollo spacecraft bill itself.

Manpower cuts will be severe, with California by far the hardest-hit state with 16,000 NASA and contractor jobs to be eliminated there in the next 18 months. In addition, the agency’s Sustaining University Program of research support, trimmed in past years from \$30 million to \$7 million, is finally being dumped completely, although NASA officials point out that about \$90 million of NASA money will still go into university work.

As the cutting goes on, NASA officials hope that new programs can be fired up soon enough to keep large chunks of the agency from going into what Assistant Administrator for Administration William Lilly calls “the mothball mode.” □

MARINE SCIENCES

More research, few ships

The budget includes \$537.2 million to support Federal activities in marine science and technology. This is an increase of \$22.9 million over the current fiscal year. The funds are contained in the budgets of 11 different departments and independent agencies.

Civilian programs constitute \$293 million of the new budget. This is the first year since 1966, when the marine sciences program was defined in its present form, that the military’s share of the total wasn’t more than half.

Of the total, \$337.5 million is for research and development. An additional \$46.5 million is for investment in ships, major equipment and shore facilities, and \$153.2 million is for operations. The totals reflect a shift toward more expenditures for R&D and less for ships and facilities.

Most of the new money is to implement the Administration’s five-point interim marine sciences program announced in October 1969 (SN: 10/25, p. 372), pending more complete governmental review of the recommendations of the Stratton commission (SN: 2/1/69, p. 111).

Funds were requested for the International Decade of Ocean Exploration,