R&D fares well in 1987 budget as Congress fights deficit

Say this about the 99th Congress: It concluded with a cliffhanger. By dawdling and dithering for months and failing to pass a single appropriations bill by the start of fiscal 1987 last 1 October, it caused the government to run out of money and forced Federal workers to leave their jobs that day. In the next eight days, Congress agonized over two stopgap spending bills to keep the government operating and fretted about being held hostage by the budget when members should have been home campaigning for election. On Capitol Hill, members and staffs pinned on buttons reading, "Free the 99th Congress." At last, on 17 October, Congress approved H. J. Res. 738, the continuing resolution for fiscal 1987, cramming into one gigantic bill all 13 appropriations measures that serve customarily to fund government departments and agencies—the first time in the last 36 years that Congress has done this.

The massive legislation provides $576 billion, the largest amount in history, for all government outlays (except Social Security, medical benefits and debt payments) and contains more attachments and instructions for departments and agencies than old-timers on Capitol Hill can recall in previous budgets. The budget resolution holds so much so haphazardly that it will take some time to decipher. In fact days after President Reagan signed the bill on 18 October someone noticed that it lacked two pages that authorized the General Services Administration to spend $2.4 billion to rent and operate government buildings throughout the country. Once the missing pages were found and inserted, the President, on 31 October, signed the document into law as P. L. 99-500.

Accomplishments. For all its disheveled appearance, Congress did well to hold the budget tide to about a 1% rise over last year—the smallest increase in a decade. Still, the 1987 budget is estimated to result in a deficit of about $154 billion, barely enough to meet the goal of Gramm–Rudman–Hollings, which calls for reducing the deficit next year to $144 billion, give or take $10 billion. Under G–R–H, if spending goes beyond this figure, Congress is supposed to step in and sequester funds to ensure the target is met. On the final day of its session Congress came up with savings of $11.7 billion to bring the deficit under the $154 billion mark. The savings were largely one-year credits, including windfalls from the first year of the new income-tax law and a one-day delay in raising military pay.

Despite the chaotic conclusion of the 1987 budget process, the R&D agencies do quite well. The two largest gainers are NASA, whose R&D budget takes off by 19% to $3.1 billion, and the National Institutes of Health, whose account is sweetened by 20% to around $6 billion. NASA's total budget of $7.8 billion authorizes construction of a new space orbiter but obligates only $100 million to be spent during fiscal 1987—and that amount is available after next 15 August. Even so, the space agency got nearly $3 billion transferred from DOD for the replacement shuttle and operations related to the Challenger disaster last 28 January.

NIH also has friends in high places. After the Administration sought to cut the NIH budget by 9%, Congress performed its annual ritual, coming to its rescue with more than either the House or Senate had proposed in their respective appropriations bills for the agency.

Provisos. NASA's appropriation calls for $529 million for physics and astronomy ($10 million less than the request), $374 million for planetary exploration ($51 million more) and $410 million for the space station. The space station, said the House authorization act for NASA, "may be used only for peaceful purposes."

The act agrees with the scientific community's recommendation that NASA should use expendable rockets along with its shuttles to place payloads in space and requires James C. Fletcher, NASA's administrator, to report by 15 February on how the agency intends to deal with this legislative mandate. The most controversial issue for NASA turned out to be a National Space Council, which the Senate added to both an appropriations bill and the continuing resolution at the urging of Donald W. Riegle Jr, Democrat of Michigan. The council would have become the principal policymaking body in the executive branch for military and civilian space programs. It was to be somewhat more restricted in scope than the National Aeronautics and Space Council, which was dismantled along with the President's Scientific Advisory Council in 1973. When the President objected to the new council, it was removed from the continuing resolution, and when the NASA appropriations bill reached the White House on 14 November, Reagan vetoed it because of the council. The bill also contained a "Buy American" provision that would have prohibited NASA from purchasing any foreign-made equipment. Reagan objected on the grounds that it would violate existing trade agreements and result in foreign retaliation.

Unscathed. The National Science Foundation escaped cuts proposed by the House and wound up with an appropriation of $1.6 billion, which is only about $63 million less than had been requested last February. Still, it was $165 million, or 11.3%, more than NSF got after the cuts imposed by the G–R–H automatic reduction for fiscal 1986. For research and related activities, the act provides a total of $1.4 billion, $72.9 million more than the House had recommended and $72.9 million below the full amount of the Administration's request, which the Senate had voted. The conference committee went along with the argument put forward by Representative Edward Boland, a Massachusetts Democrat who heads the NSF appropriations subcommittee, that science could adjust to slower growth after its budget run-ups in recent years. Even so, NSF research is increased by $112 million, to 8.7% more than the G–R–H level it

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operated on throughout fiscal 1986.

Largely at Boland's insistence, $10 million more was added to NSF's requested $89 million for educational programs. The additional sum is specified for pre-college teacher training and informal science education. Congress also insisted that NSF avoid making any cuts in global geoscience (set at $35 million), ocean studies ($133.6 million) and programs for women and minorities ($11 million). Astronomy at NSF was capped at the requested $85 million. The Senate had proposed a $4 million addition for astronomy, but Boland convinced the conference committee this wasn't necessary. The conference report urged that the agency fund the university supercomputing centers to the maximum extent possible. In addition, it directed NSF to dispense $500 000 earmarked for the hard-pressed International Institute for Applied Systems Analysis in Vienna for fiscal 1986 and to allocate the same amount to IIASA in 1987.

Campaign. NSF's *Congressional Report*, prepared mainly for the National Science Board, observes that members of Congress have stated in public and private that "without the efforts expended this year by the academic and industrial science and engineering research and education communities to educate and inform [them] on the importance of investing adequately in basic research, it would have been impossible to have achieved this year's budgetary success."

It so happened that after the House slashed $136 million from Reagan's proposed budget increase of $228 million for NSF in 1987, Raymond E. Bye Jr, who directs the agency's office of legislative and public affairs, fired off a "Dear Colleague" letter to more than 5000 well-placed leaders in science and education. He alerted them to a "crucial opportunity to rectify the House's recommendation." Indeed, wrote Bye, "Now is the time" to urge the Senate to endorse the President's full request of nearly $1.7 billion. Just in case some readers missed the point, a handwritten note in a corner of the letter exhorted them to "Call now!" A week later, after the Senate had approved the full increase and added another $10 million for good measure, Bye mailed a second letter hailing the response from readers and clamoring that "one final push must be made" to persuade Congress to go for the higher level. The mailing paid off, but in the aftermath NSF was accused of acting like just another lobbying operation in Washington. Bye admits to being "a little bit overzealous." Government officials are forbidden by law from lobbying so directly.

As a follow-up to the 1987 appropriation, NSF has prepared a budget for fiscal 1988 that calls for an increase of at least 30%, much of this to go to science and math education, additional fellowships and science and engineering research centers. The success of this 1988 increase is likely to be dependent, NSF Director Erich Bloch had reasoned, on whether Congress fully approved the 1987 budget. OMB would be more supportive of the larger NSF budget for 1988, Bloch has suggested, if the agency got all it asked for in 1987.

DOE and DOD. The Department of Energy budget for 1987 is about $12 billion, the same as the President asked for in February. While DOE expects to reduce its overall spending from $12.2 billion in fiscal 1986, plans call for its weapons expenditures to rise to $7.5 billion, which is $240 million more than the 1986 level. DOE's weapons activities include $317 million for R&D on the Strategic Defense Initiative.

The figure for DOE basic energy sciences seems somewhat better than it is. At $537 million it is some $95 million above last February's request. But that covers nearly $94 million for specific "pork barrel" projects (see table, above) that Congress added to the Office of Energy Research's basic-energy-sciences program in the continuing resolution. Another three centers are to be funded out of the operations segment of high-energy and nuclear physics and health and environmental research programs. These earmarked items are for universities and medical institutions that some cynics ascribe to Congressional generosity at election time. One item that is hard to find in the continuing resolution involves the supercomputer center at Florida State University, a project pushed over the past three years by Representative Don Fuqua, chairman of the House Science and Technology Committee, who decided not to run for reelection in his Florida district this year.

DOE's general science and research programs are funded in fiscal 1987 at $708 million, which is $65 million below the original request but $31 million more than the Senate would have given. The agency's Office of Energy Research will determine the operating budgets for high-energy physics and nuclear physics after apportioning a $35 million reduction between the programs. Nuclear physics appears to get a significant increase from last year's $216 million, but it is still $8 million less than the request. The increase is largely for starting construction on the Continuous Electron Beam Accelerator Facility at Newport News, Virginia.

High-energy physics is awarded $524.7 million, which is $30 million above the fiscal 1986 post-G–R–H figure but still $20 million below the

Congressional 'pork' for DOE research budgets

Fiscal years	1984	1985	1986*	1987
			(thousands of dollars)	
Funded in basic energy sciences:				
Vitreous State Laboratory, Catholic University	5 000	8 900	—	—
National Center for Chemical Research, Columbia University	5 000	3 000	7 698	4 000
Advanced Science Center, University of Oregon	—	2 300	8 179	22 900
Center for Science and Technology, Atlanta University	—	250	4 330	7 500
Center for Energy and Biomedical Technology, Tulane University	—	—	5 773	—
Demonstration Center for Information Technologies, Brown University	—	—	4 811	5 000
Center for New Industrial Materials, Iowa State University	—	—	—	6 000
Energy Research Complex, University of South Carolina	—	—	—	16 300
Energy Demonstration Project, St. Christopher's Hospital for Children, Philadelphia	—	—	—	14 800
Center for Nuclear Imaging Research, University of Alabama at Birmingham	—	—	—	12 300
Center for Science and Engineering, Arizona State University	—	—	—	5 000
Supercomputer Computations Research Institute, Florida State University	—	7 000	8 177	11 400
Funded in other science research programs:				
Energy Utilization Project, Center for Excellence in Education, Indiana University	—	—	—	3 800
Institute of Nuclear Medicine of New Jersey	—	—	—	3 000
Graduate Research Center, University of Oregon	—	—	—	1 200

Millions of dollars of set-asides have been inserted in Department of Energy nonmilitary scientific research budgets since 1984, the first year that Congress dipped into its "pork barrel" for a select group of universities and other institutions. Money for the first 12 building projects in the table comes from Office of Energy Research basic-energy-sciences programs. The last three facilities find support in high-energy and nuclear physics operations and health and environmental research programs in the Office of Energy Research; in fiscal 1986 Congress added Oregon's graduate center to the Department of Defense appropriations bill and Indiana's education center to the Department of Education budget.

*Amounts indicated in 1986 show cuts under Gramm-Rudman-Hollings law.

request. In the final reckoning, though, major reductions in high-energy physics are likely to affect operations of the recently completed Tevatron at Fermilab and the Stanford Linear Collider.

Magnetic fusion gets an increase above the Administration's request, but the funding is still $20 million below last year's level. The final figure is $345.5 million, or $12.5 million above the February request. In its report on DOE appropriations, the House Science and Technology Committee expressed concern about the funding and direction of the magnetic-fusion program. It was particularly derisive about the agency's decision to mothball the MFTF-B at Lawrence Livermore Laboratory before the machine could produce any experimental results. "Continuation of MFTF-B should be a high priority if additional funds can be made available in the appropriations process," said the House committee's report. It also urged that DOE seek international collaboration and funding for a fusion ignition project and suggested that one source could be the Soviet Union—though it admitted that the "spirit of Geneva" that led Reagan and General Secretary Mikhail Gorbachev to call for joint research in fusion might falter because of Administration fears about technology transfer to the USSR. The House then directed DOE to investigate the civilian energy potential of inertial-confinement fusion "in view of the recent . . . progress achieved in the ICF laser program as well as in complementary underground tests."

The University Research Instrumentation program continues to be underfunded at $5 million, despite the good intentions of DOE's Office of Energy Research.

The DOE budget allows research to continue on the Superconducting Super Collider but Congress reiterates its demand that the department submit specific plans to Congress on how it plans to finance the mammoth project. In the interim, while Energy Secretary John S. Herrington continues to be coy about when he will announce his decision about SSC to Reagan and the Cabinet, another community of scientists, molecular biologists, is drumming up support in political circles for a multimillion-dollar program to sequence the entire human genome.

In DOD's part of the continuing resolution funds for the Strategic Defense Initiative, popularly called "Star Wars," were held to $3.2 billion, though another $317 million for SDI went to the military programs in DOE, to be spent largely at Livermore, Los Alamos and Sandia Laboratories. The total SDI appropriation for 1987 is $3.5 billion—well below the $5.4 billion the President sought. A proposal, which caused great consternation in Europe, to limit contract SDI work to US companies failed to survive into law.

Impasse. Congress and the White House nearly reached an impasse over the continuing resolution when President Reagan objected to language on arms control included in the proposed legislation. Title XI of the continuing resolution begins with a one-year prohibition on testing an antisatellite weapon in space until the President certifies to Congress that the Soviet Union has conducted a test of a "dedicated" antisatellite weapon in the heavens. What's more, Democrats in the House sought to force the President to halt production of chemical weapons, abide strictly by the terms of the still unsigned SALT II agreement and refrain from further nuclear tests so long as the Soviet Union did likewise. Under the final compromise, the Pentagon can proceed to procure 155-mm shells containing binary nerve gas, but procurement of the controversial BIGEYE binary chemical bomb is delayed one year—though $90 million is released for facilities to build the bomb.

On the nuclear-testing issue, Congress traded its insistence on a moratorium for an agreement from Reagan to submit to the Senate for ratification the Threshold Test Ban Treaty of 1974 and the Peaceful Nuclear Explosions Treaty of 1976. In signing the appropriations bill, Reagan in effect ratified the "sense of the Congress" resolution to resume negotiating immediately with the Soviet Union on a verifiable, comprehensive test-ban treaty—a policy supported by five previous occupants of the White House. In addition, the continuing resolution contains a strong but nonbinding formulation urging the President to abide by the terms of SALT II.

—IRWIN GOODWIN

OMB formulates a 3.6% solution for university overhead

Few issues have strained relations between universities and Washington more in the past two decades than the indirect overhead costs the Federal government pays on research grants. The anger and mistrust churned up on this subject has led to rifts not only between academic and government officials but between researchers and their own university administrators.

Government agencies argued that while it's right to reimburse academic institutions for such items as depreciation on buildings and equipment, lighting, heating and maintaining libraries, it's wrong to pay for such administrative costs as salaries of departmental deans and their secretaries and other incidentals. University investigators, for their part, smarted over "effort reporting," which required them to account for every bit of time they spent on management matters as well as on teaching and research. Critics of effort reporting insisted the numbers submitted to government "bean counters" were usually pulled out of the air.

Escalation. Arguments over indirect costs have escalated in part because payments for overhead have taken a larger share of government support for academic research each year. This was documented in a report issued late last year by the inspector general's office of the Department of Health and Human Services indicating that total payments for indirect costs nearly doubled in a six-year period, from $900 million in 1978 to $1.7 billion in 1984. It turns out, says the HHS report, that administrative costs were the fastest-growing component of academic overheads, climbing from $495 million to $960 million in the same period. The increases drove up the overall indirect-cost rate from 36% of direct costs in 1978 to 46% by 1984. While most of the rise could be ascribed to higher equipment and facility costs, which the report found "reasonable and beneficial" to research sponsored by the Federal government, and to the double-digit inflation the country experienced during part of the period, nonetheless almost one-third of the administrative costs paid to universities in 1984 "did not benefit government-sponsored research."

Attempts to resolve the issue led to colloquies at the National Academy of Sciences, hearings on Capitol Hill and debates between university heads and government officials. The issue became so enflamed that a panel of the White House Science Council studying the health of research universities entered the fray (PHYSICS TODAY, March, page 65). It recommended that the Office of Management and Budget set a fixed cap on administrative costs, to be based on experience gained over the past five years and phased in over two years, lest the new reimbursement rate cause disruption in academe. It also urged the government to introduce "realistic" cost allowances for the use of buildings and equipment, to provide faster depreciation for items of infrastructure and to do away entirely with effort reporting. The panel, under