

WASHINGTON REPORTS

Specter of SSC Haunts Spallation Neutron Source As Recently Appointed Project Director Takes Charge

In politics, the past is often prologue for big science projects. This is being borne out by the \$1.36 billion Spallation Neutron Source (SNS), which the Department of Energy (DOE) wants to build at Oak Ridge National Laboratory in Tennessee. Now scheduled for completion in 2006 and for operation the following year, the SNS is designed to deliver pulsed neutron beams of unprecedented brightness for use by materials scientists, condensed matter physicists and research biologists to study crystalline and molecular structures. At 2 MW, the machine would be more than ten times more powerful than ISIS in Britain, currently the world's leading neutron spallation source. But for all its great features, the SNS is under threat in Congress, mainly because of previous experience with an even larger project.

To F. James Sensenbrenner Jr, the pugnacious chairman of the House Science Committee, the SNS is a metaphor for the Superconducting Super Collider (SSC), which Congress terminated in 1993 for reasons of escalating costs and faulty management. "I am not going to sit still for another SSC fiasco on my watch," said Sensenbrenner in an interview, after he issued a scathing report on the neutron source. In the report, he characterized the project management as "in turmoil," the estimated cost and construction schedule as "not fully developed," and the spending outlays so far as "lagging." He warned that he will oppose Congress's appropriation of construction funds unless he is assured that the SNS is on track. "While the project is scientifically meritorious and R&D should be continued," he wrote in his report, "it clearly needs more front-end preparation before it is ready for full construction."

DOE asked for \$214 million for the SNS in the fiscal 2000 budget, but the House Science Committee's authorization bill (H.R. 1655) would provide only \$17.9 million for continued R&D and withhold the rest, \$196.1 million, which was proposed for starting construction. In recent years, however, the committee's authorization bills have rarely been enacted. In the current fiscal year, the project received an appropriation of \$130 million, though Congress had been asked by DOE to

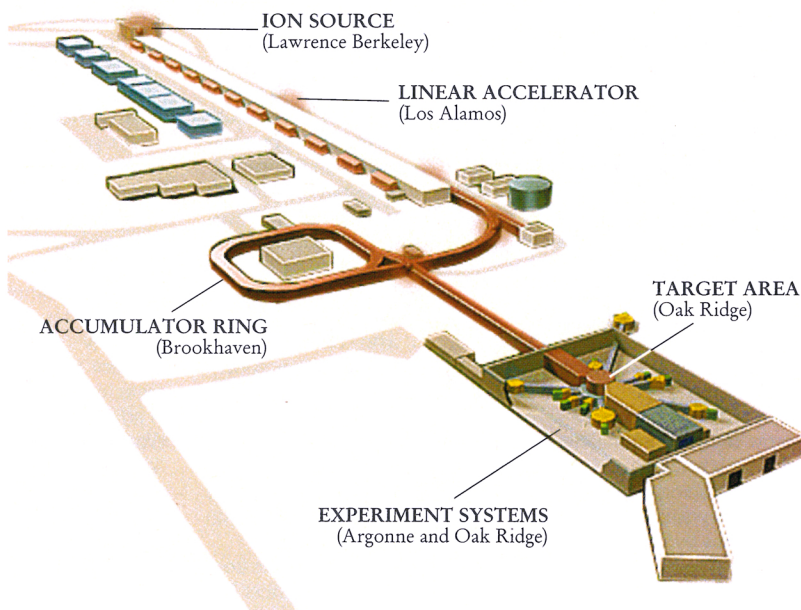
come up with a full \$157 million.

The SNS was developed at Oak Ridge, with the lab as its preferred site, after a more ambitious plan for a reactor-based facility, the \$3 billion Advanced Neutron Source, was abandoned by DOE in 1995. No major neutron source has been built in the US for 30 years, and for most of a decade, neutron users in universities, industry, and national labs have been at a disadvantage compared with researchers in Europe and Japan, where newer and more powerful machines are operating. The SNS would augment the research capabilities on aging US reactor facilities. The new machine would consist of an ion source, a linear accelerator, a proton accumulator ring, and a research facility containing a liquid mercury target producing neutron beams, as well as a suite of neutron scattering instruments. To make up for Oak Ridge's inexperience in accelerator technologies, DOE brought four other national labs into the SNS's construction: Los Alamos in New Mexico, Lawrence Berkeley in California, Brookhaven in New York, and Argonne in Illinois. DOE also thought of the collaboration as a way of boosting political support for the project outside of Tennessee—a lesson the department learned too

late to save the SSC, located in Texas.

In his report on the SNS, Sensenbrenner, a conservative Wisconsin Republican, detected a few flaws in this partnership: "DOE's complex management approach requires further simplification and the current memorandum of agreement [with the five laboratories in the project] should be substantially strengthened." He noted that the labs reported to different DOE field offices and had individual overhead rates set by different contractors. He also objected to a \$35 million "use tax" that Tennessee planned to levy on the project. A lawyer before he entered politics, Sensenbrenner cited an obscure reference in the US Code that exempted the Atomic Energy Commission and its contractors from taxation "in any manner or form" by any state, county, or municipality. The AEC is, of course, one of DOE's predecessors.

Sensenbrenner is not alone in his concern about the SNS. Some neutron scientists, the director of a DOE lab, and a Clinton Administration official who had supported the facility in the past, all say privately that the project has been in trouble since last summer. And in January, Victor Rezendes, who heads the energy, resources and sciences branch of the General Accounting



SNS COLLABORATION: Five DOE laboratories contribute their expertise.

Office (GAO), Congress's watchdog agency, told the House Science Committee that the SNS was heading for trouble. The situation wasn't serious yet, he said, but the committee needed an early warning. Rezendes was perturbed by the lack of experienced direction, adequate staff and contingency funding in the project's construction budget. That same month, an internal DOE team led by Dan Lehman, director of the Office of Science's construction management support division, reported that GAO's findings didn't go far enough. The project office at Oak Ridge had been unable to appoint a qualified technical chief or to "assert technical leadership." The staff at the site, the review stated, has "insufficient experience in the management and leadership of large, complex projects."

With criticism of the SNS in substantial agreement, Sensenbrenner began thinking that DOE was doing "an appalling job," and so he decided to visit Oak Ridge during Congress's Eas-



SENSENBRENNER: Offering 'tough love.'

ter recess in late March. But a month before Sensenbrenner's trip, Alvin Trivelpiece, Oak Ridge's politically savvy director, outmaneuvered Sensen-

brenner by selecting David E. Moncton, associate director at Argonne National Laboratory near Chicago, to head the project. Moncton, on loan from Argonne to Oak Ridge, is well regarded in DOE circles for building Argonne's Advanced Photon Source, completed just ahead of schedule and slightly under its estimated cost. On his visit to Oak Ridge, Sensenbrenner met Moncton and, after listening to his plans for the project, the congressman decided that Moncton was right for the job.

Moncton, for his part, admits that the project is three to six months behind schedule but insists that this can be made up. "The most important thing right now is to attract the best people possible with expertise in accelerators and construction and to integrate them with the partner labs, as if everyone is working for the same employer," he said. "I know there are some serious issues, and I have proposed what I consider to be serious remedies."

On 13 April, Moncton submitted an

WASHINGTON BRIEFINGS

► **Toward a Permanent R&D Tax Credit** To pay the cost of the aerial bombardment of Yugoslavia, Congress may have to give up on cutting taxes in fiscal 2000, but there's one tax reduction that the lawmakers are likely to enact—the R&D tax credit. The credit, which Congress has extended nine times over the past 18 years, never more than 18 months, will expire on 30 June unless a new one is legislated. A study last year by Coopers & Lybrand reckoned that US businesses would spend \$41 billion more (in 1998 dollars) on R&D if the credit is extended. Furthermore, Coopers & Lybrand suggested that innovations derived from the additional R&D would improve the nation's productivity by as much as \$13 billion a year as soon as the year 2010.

It's not surprising, then, that high-tech companies in particular are enthusiastic about the tax credit, which rewards corporations for significant incremental increases in their research costs.

Silicon Valley's Technology Network, a bipartisan political group representing the computer and communications industry, has hired a platoon of lobbyists to influence lawmakers to renew the legislation. TechNet supports House and Senate bills that would provide a 20% credit for research and experimentation costs that are above and beyond the sums that corporations usually spend.

On 24 February, two House members whose districts embrace high-tech companies, Nancy Johnson, a Republican of Connecticut, and Bob Matsui, a Democrat of California, introduced a bill (H.R. 835) that would make the tax credit permanent in the Internal Revenue Code. Their bill was followed on 4 May by a Senate version (S. 951) from New Mexico's Pete Domenici, a Republican, and Jeff Bingaman, a Democrat. Domenici, who chairs the chamber's powerful budget committee, contends that a permanent extension of the tax credit would cost the government about \$28 billion over ten years, but would return much more to the economy. The proposed Domenici-Bingaman legislation includes several new features, such as tax credits for the expense of preparing and publishing basic research papers and of industrial partnerships with universities and national laboratories, which are likely to run up credits by another \$10 billion in the first decade.

Until recently, these bills and an earlier one (H.R. 760) from House Science Committee Chairman F. James Sensenbrenner Jr, a Wisconsin Republican, and the committee's senior member, George E. Brown Jr, a California Democrat, lacked the support of

the White House. But when Vice President Al Gore Jr was out in Silicon Valley in April to win friends and campaign funds for his shot at the presidential elections in 2000, he did a half gainer. Gore flipped the Administration's position on the fiscal 2000 budget request for the usual one-year R&D tax credit and announced that he, too, favored a permanent credit "in the effort to strengthen our nation's commitment to R&D."

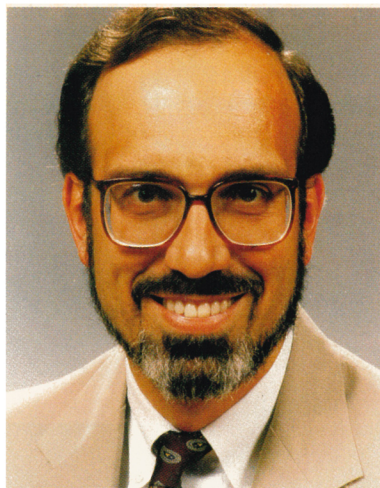
► **Scientific Advice to the World** Distressed by the bureaucracy and ineptness of most international organizations established by the United Nations, Bruce Alberts, president of the US National Academy of Sciences, advocates a prestigious new body that can provide world leaders with objective scientific and technical advice. "The world badly needs an impartial mechanism, based only on science, to promote smarter decision making" on everything from water policies and energy strategies to vaccine inoculations and computer communication, he told academy members at their annual meeting in Washington on 26 April.

To provide that service, Alberts announced that the US academy has taken the lead by organizing the Inter-Academy Panel on International Issues, or IAP, an informal network of 80 science academies. IAP is already preparing for a Conference of Academies in Tokyo next May. The subject of the conference is sustainable development in a world that may need to accommodate 10 billion people in the 21st century. The next step, said Alberts, is to create a global version of his academy's National Research Council, which appoints independent panels to study tough problems faced by government agencies. "These panels of experts would be set up on demand to advise global institutions, such as the United Nations and the World Bank, on issues of critical importance to them," he noted. "Why this and why now? In the years ahead, policy making institutions all over the world will face increasingly complicated issues involving questions of scientific validity and balance."

"The concept is a good one," says Roland Schmitt, former vice president for research at General Electric, onetime chairman of the National Science Board, and president emeritus of Rensselaer Polytechnic Institute. A world body of the type Alberts proposed has been suggested before, Schmitt adds, but

assessment report and action plan to Martha Krebs, director of DOE's science office. By July, he proposes to have an experienced key staff in place, along with a validated technical, cost, and schedule baseline and adequate cost and schedule contingencies. The plan also calls for new memorandums of agreement for all five labs that will formally assign accountability for deliverables and staff. In addition, managers of the labs and contractors would agree to capping overhead rates for the life of the project. By October, according to the plan, a geotechnical analysis of the site would be completed, an optimal design for the target facilities would be established, and "fully integrated and efficient project management systems" would be accepted by DOE.

Sensenbrenner has approved Moncton's action plan, but still has reservations, especially about supporting construction funds. He and George E. Brown Jr of California, the senior



MONCTON: Proposing 'serious remedies.'

Democrat on the House Science Committee and its former chairman, have asked GAO to continue monitoring the project's progress. Brown has endorsed

the SNS, but wants favorable reports by GAO and DOE's Lehman panel before he votes on line-item funding for the project. "If the DOE cannot get its act together and give us firm cost estimates by the time the appropriations bill comes up in the House, I'm not going to support the project," Sensenbrenner told an interviewer. "I think the project is in need of tough love, and I will provide that."

Not surprisingly, Tennessee members of Congress have voiced their opposition to Sensenbrenner's threat to block SNS's construction money. Senator Bill Frist, a first-term Republican, and Representative Bart Gordon, a seven-term Democrat, are rounding up support for the project.

While Krebs is willing to accept less than the DOE request for the SNS construction budget in fiscal 2000, she notes that there is a certain point at which funding shortages could delay or even defeat the project. **IRWIN GOODWIN ■**

the academy "appears to be the first to move from word to action." Alberts expects to advance the idea at a worldwide scientific summit this month in Budapest, Hungary.

► **Chernobyl's Fallout Revisited** On 26 April, the 13th anniversary of the devastating fire at the Chernobyl nuclear power plant in Ukraine, Energy Secretary Bill Richardson announced his plan to get a close-up look at progress on safety, environmental, humanitarian and economic actions taken there. In collaboration with energy ministries in the G-7 countries and Ukraine, the Department of Energy has provided assistance with the permanent shutdown of Chernobyl's Unit 4 graphite-moderated reactor. But serious problems remain. One involves work to improve the hastily constructed sarcophagus enclosing the ruined reactor. The project to stabilize and strengthen the crumbling structure is now in its eighth year, while right next door, Chernobyl's Unit 3 continues to operate, generating electricity and steam heat. Ukraine has promised to close Unit 3 by 2000, and the US is funding construction of a conventional heat plant, mainly for the nearby town of Slavutych, built to house Chernobyl workers and their families after the city of Pripjat was evacuated during the lengthy fallout period.

On 27 May, Richardson took part in the opening of Slavutych's International Radioecology Laboratory, where, since 1992, researchers from the University of Georgia's Savannah River Ecology Laboratory have been studying the uptake of radioactive materials by organisms, the molecular and genetic effects of chronic exposure to ionizing radiation, and the concentrations of radioactive elements in soil and sediments. They will now be joined by scientific teams from Texas Tech, Texas A&M, Purdue and Colorado State to examine the risk to human health and ecosystem stability from radioactive exposure and to evaluate the effectiveness of remediation technologies.

► **Roles and Rules in the Government-University Partnership** University officials have been offered the chance to tell the White House what they think of its new draft report on the sometimes strained relationship between government and academia, especially when it comes to Federally funded re-

search programs. The issue of improving relationships is complicated by a welter of Federal laws, circulars and regulations that cover such matters as allowable costs, compliance, and audit practices. Because there are no widely accepted, overarching guidelines, the government-university research partnership is defined primarily in *ad hoc* ways, which makes for confusion and consternation.

The issue came to President Clinton's attention in the summer of 1996, when leaders from industry and academia, state governors, and members of Congress wrote to complain that incremental changes in government policies and administrative practices were detrimental to university research. A presidential directive in September 1996 called on six research agencies (namely the National Science Foundation, Department of Energy, Department of Defense, NASA, National Institutes of Health, and Department of Agriculture), along with the Office of Management and Budget and the Office of Science and Technology Policy, to review the situation, solicit input from universities, and deliver a report by 30 April 1997.

The draft, two years late, went into public circulation on 27 April, when Clinton announced its availability at a White House ceremony honoring the 1998 winners of the National Medal of Science and Technology. The report is full of platitudes—such as "the integration of research and education is the hallmark of our American system of universities" and "Federally supported university-based research is a critically important investment by the nation in its future prosperity and well-being"—and it only alludes to the main issue for academics: money. In 1998, the Federal government put up \$15.2 billion for university research, more than 60% of all funding for such research. Even so, academic leaders want the government to spring for a larger bottom line and also to increase the payments for overhead costs for Federally funded research on campus.

The report is available on the Web (<http://www.whitehouse.gov/WH/EOP/OSTP/html/rand/contents.htm>).

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