

the arms race has been on modernizing the US and Soviet arsenals by upgrading their versatility and accuracy, not on increasing the size of the

stockpile. Indeed, they say, the present size and composition of the strategic forces on both sides "are not only expensive anachronisms but pose a

latent threat that can no longer be justified, even by the criteria that once led many to accept the risk of nuclear war." —IRWIN GOODWIN

MAKING NEWS BY CALLING IT QUILTS, BUCY LEAVES A MESSAGE FOR THE SSC

Without any warning, J. Fred Bucy resigned on 12 July as chairman of the Texas National Research Laboratory Commission, which oversees the state's financial patronage of the SSC. In a letter to Governor Ann Richards, Bucy formally quit the commission, formed in 1987 to help acquire the Superconducting Super Collider project for the Lone Star State. Bucy, a solid-state physicist who was president and chief executive officer at Texas Instruments until he retired in 1985, had worked for the SSC as head of the Texas Scientific Advisory Council before the Department of Energy chose a site near Waxahachie for the project in November 1988, immediately after the election of President Bush, an adopted Texan.

It was Bucy, in fact, who led the review of the 14 locations the state considered as possible sites for the giant collider before submitting its final choice to DOE. Despite his intense involvement, he turned down the offer to preside over the commission until he was pressed last October by Texas's lame-duck governor, William Clements Jr. Bucy's predecessors heading the commission were a succession of celebrated Texans: Peter T. Flawn, president emeritus of the University of Texas; Tom Luce, a wealthy lawyer prominent in state Republican politics and an associate of Ross Perot, the multimillionaire founder of Electronic Data Systems; and Morton H. Myerson, a former president of EDS and a principal backer of the resplendent new Myerson Symphony Center in Dallas.

Corralling contributors

Along with Bucy, these four were among the prominent Texans who helped lasso the SSC. They succeeded in corralling Texas voters and legislators to contribute \$1 billion. With this money, the state is buying some 16 700 acres of countryside in Ellis County, laying down roads and sewers, putting up power lines and buildings, and shelling out for pre-college education and graduate fellowships. The commission has lobbied Congress vigorously to fund the project in each of the last four years. Last February the Bush Administration asked Con-

gress to put up nearly \$533.7 million for the SSC in fiscal 1992, which starts on 1 October. Everyone associated with the enormous project admits that it has not been easy to gather support in Congress when the nation's 1992 budget deficit may actually come to \$348 billion—almost \$67 billion more than the \$282 billion Budget Director Richard Darman recently recalculated as the 1991 deficit, which in turn would set a new record over the nation's previous high for red ink, \$221 billion in 1986.

In the past three years, as budget requests for the SSC have burgeoned, opposition in Congress has increased, judging by the votes. In May, after an angry debate on the House floor, members voted 251 to 165 to continue funding the project, though they whacked \$100 million from the Administration's request. DOE and SSC officials claim that such a large cut would surely add at least six months to the project's construction schedule and run up the total cost by roughly \$210 million.

On the Senate side, Dale Bumpers, a veteran Arkansas Democrat, introduced an amendment to the 1992 energy bill on 10 July that would "zero out" the collider. The motion failed 62 to 37. The size of the opposition in this first "up or down" vote on the SSC ever cast in the Senate startled the project's proponents. Bumpers had argued against the supercollider mainly on budgetary grounds, mocking its current cost estimate of \$8.25 billion as nearly a 200% increase over the original figure of \$4.4 billion, reckoned more than four years ago. He also ridiculed the claims of advocates that the SSC would lead to many practical benefits and such commercial spinoffs as medical imaging. "You will find that the Superconducting Super Collider cures cancer and earaches and gives you an appetite if you are not hungry," he said facetiously during the floor debate. Seeking to persuade senators from Illinois, New York and California to join him in killing the project, Bumpers observed that "we cannot finance the supercollider and still finance Fermilab, Brookhaven and SLAC." When the SSC is completed

in late 1999, he noted, it is virtually certain that two of those labs will be closed. Of the senators from the three states, only Daniel Patrick Moynihan of New York, the final tally revealed, voted against the SSC.

Expecting a shortfall

Opposing Bumpers's amendment were two of the Senate's most influential Democrats—J. Bennett Johnston of Louisiana and Lloyd Bentsen of Texas, both chairmen of powerful committees and both representing states that stand to gain jobs and other economic benefits from the SSC. One surprising skeptic was Malcolm Wallop of Wyoming, who almost always accepts the Administration's line. He observed that Congress decided last year that no more than two-thirds of the total cost of the SSC should be paid out of Federal funds. Under the current estimate, said Wallop, the Federal share would be \$5.5 billion, and even with Texas's \$1 billion there is likely to be "a shortfall of about \$1.7 billion to be made up by foreign governments. . . . While I support the funding request in this year's appropriation, it will be much more difficult to support this project next year if there are no firm foreign commitments. . . . It would be prudent for the Department of Energy to present Congress with a plan on how to proceed without foreign contributions."

At the end of the debate, the Senate, by a vote of 96 to 3, passed its version of the 1992 Energy and Water Development Act, which assigned \$508.7 million for the supercollider—\$75 million more than the House. On 30 July, a subset of representatives and senators on the two Appropriations committees just about split the difference and gave the SSC \$483.7 million—exactly \$50 million less than the Administration had requested for fiscal 1992.

Bucy's resignation pointed up the SSC's funding dilemma—that without foreign contributions the project faces continued opposition in government circles as well as in science communities, where fears persist that megaprojects like the SSC and NASA's space station will siphon large sums from

university research. "The issue has to be addressed now," Bucy explained in an interview by telephone, "because next year the SSC will need even more money and Federal funds will be scarcer."

So far, the SSC has received a funding commitment from only one foreign government. India has agreed to contribute \$50 million in the form of accelerator components and funds for sending physicists to Texas. The deal with India was initiated three years ago by Leon Lederman, then director of Fermilab and a friend of M. G. K. Menon, who was Rajiv Gandhi's science and technology minister at the time. It was confirmed a few months later in Delhi during a meeting on the Reagan-Gandhi science and technology initiative, though D. Allan Bromley, who headed the US delegation, doesn't recall that India signed any formal agreement on the SSC. A year later, Bromley became President Bush's science and technology adviser.

While Bucy applauds India's decision, he cautioned that the SSC can't be fully funded or completed without larger contributions from abroad, principally from Japan. "I have grave doubts that Japan is going to put up anything like the \$2 billion that Department of Energy folks seek, though Japan may send a token amount in the next two or three years," Bucy recalled that DOE's deputy secretary, W. Henson Moore, led a delegation to Tokyo last year to attract funds for the SSC—and left with nothing more than a polite "Thank you for coming to see us."

"It's going to take more than a deputy secretary or two talking to Japanese government officials to get that kind of contribution," said Bucy. "They have their own problems, and science competes for tight funds." If Japan wanted to contribute a significant sum for the SSC, Bucy declared, "it would be in kind and it would have the full backing of the Ministry of International Trade and Industry. MITI would be taking the lead if Japanese industry is eager to join in. There are no signs of that yet."

Japan abides by certain rules in its foreign dealings: One of these requires government agencies to achieve consensus on any project with another nation. President Bush raised the question of Japan's partnership in the SSC with Prime Minister Toshiki Kaifu at their first meeting, in Washington, only three weeks after Kaifu's election in 1989. He was told that a few agencies were "considering" it, but in any event the government was too new to have

reached an agreement on the supercollider. Bush asked again when he met with Kaifu in Newport Beach, California, last April, and he was put off again. Japanese culture does not permit an unequivocal "no." In a somewhat similar vein, Japan decided it would be improper to ignore the demands of a political and economic ally that demanded "burden sharing" funds in the Persian Gulf war and in the end handed over more than \$13 billion to the US war effort.

The SSC has far fewer political and economic implications for Japan than the Gulf war. Sources within MITI



Fred Bucy: Resigned to support the SSC.

and the Science and Technology Agency say the SSC is really a basic science project—an assertion that sounds a kind of death knell for industrial involvement. The decision on whether to participate is being left to the Ministry of Finance and the Ministry of Education, Science and Culture, the most conservative and bureaucratic of the country's government bodies. At a five-day conference with Japanese officials in July, the US delegation, headed by John P. Borchert, deputy assistant secretary of State for oceans and international affairs, came away with an agreement to start 33 joint projects. The topics include advanced materials, life sciences, geosciences (particularly volcano and earthquake research), information sciences, manufacturing and process controls. Few Japanese scientists and educators favor large contributions to the SSC right now, when university facilities need to be replaced and rehabilitated. "Everywhere there seems to be a need for improving our research infrastruc-

ture," says a senior scientist.

Astoundingly, the Soviet Union, which is in dire economic shape, is almost certain to ante up "some money in kind," Bucy believes. It so happens that Soviet physicists, notably at the Nuclear Physics Institute in Novosibirsk, have informed Bromley and SSC leaders that Moscow is inclined to stake the accelerator to about \$200 million in components and materials. One of the Soviet proposals involves supplying a perforated copper liner for the SSC's stainless-steel main beam pipe, which would have the effect of reducing beam impedance from stray emissions at the machine's high current.

Aside from contributions by India and the USSR, Bucy declared, it is unlikely that the total of foreign funds from other countries—Korea, Japan, China, Canada and elsewhere—will reach even \$500 million. This shortfall in foreign funding, he feared, might induce Congress to kill the project. "It's not beyond salvation, but it's getting close," he asserted.

He resigned, said Bucy, because "it is necessary to bring to the forefront the issue of foreign support. . . . The SSC is something the country should absolutely do [even] if we pay for it all ourselves. It's something we will be proud to call our own."

Bucy, who earned his highest degree in physics, an MS, from the University of Texas in 1953 and joined Texas Instruments the same year, wants to devote his time to gaining converts in Congress to the idea of financing the SSC as a strictly American enterprise. He said that Kaifu's answer to a question about the SSC at a joint news conference with Bush on 11 July in Kennebunkport, Maine, just underscored his own impression of the problem of Japan's support for the SSC.

Asked if Japan is planning to make a substantial contribution to the project, Kaifu replied: "We did not discuss this issue today but in the past I received explanations from President Bush about the US position on this. And we've also received . . . a request for cooperation. . . . There is growing awareness in Japan that this . . . superconducting collider is important for science and technology, and researchers in Japan are studying what sort of cooperation would be possible. However, I'm not prepared today, here, to say what sort of financial cooperation is possible. And I might add that science and technology in Japan are being carried out under difficult financial situations."

—IRWIN GOODWIN ■