Commercial Isotope Venture from Defunct SSC

DOE's former Superconducting Super Collider project in Texas spawns commercial medical isotope and cancer treatment project, while DOE isotope program continues

While this summer saw plenty of government-related activity concerning the radioisotope supply for nuclear medicine (see *Newsline*, September 1994, p. 28N), another development has drawn the attention of observers in this field. The dissolution last October of the Superconducting Super Collider (SSC) left some legal wrangling to be settled between the Department of Energy (DOE) and the State of Texas, besides some empty physics facilities, and a private concern has stepped into the scene to turn one facility to medicine's advantage. The North Texas Research and Development Corporation (NTRD, Denton, TX) has maneuvered to turn a remaining linear accelerator into a commercial provider of medical isotopes and a cancer treatment center. Lon Morgan, NTRD president, said that this facility would be privately run and serve primarily as a backup to government labs that served the pharmaceutical industry, making standard accelerator-produced medical isotopes like ^{111}In, ^{201}Tl, the iodine isotopes, and a few others.

"Many government labs are not reliable because they are not [primarily] concerned with such production," Dr. Morgan said. Government-run labs have other priorities and must squeeze in isotope production when they can. "You must guarantee you can meet delivery schedules" to gain the confidence of the pharmaceutical industry. Furthermore, to assure the clientele, he said, the Texas facility would carry all necessary insurance and use appropriate GMP's. He also emphasized that, since this lab will be privately run, it must be market-driven and self-supporting.

DOE, State of Texas, and the SSC

Despite this picture of private enterprise, the proposed lab has its critics, deriving from the fact that the SSC has been the DOE's responsibility and the department has its hands full already with existing isotope programs.

In the 1980's, when the federal government was scouting for sites for the SSC, states competed by offering economic inducement packages, and Texas won with the most attractive, including a $1 billion bond investment that the voters endorsed. But once the federal government backed out, it faced threatened litigation for the State of Texas' economic commitments, and fiscal responsibilities devolved upon the DOE, which handled the project.

Figure 1. The building for the linear accelerator at the defunct SSC site south of Dallas.

On July 22, 1994, the DOE announced it had reached an agreement with Texas that would circumvent a lawsuit. Since Congress dissolved the SSC in October, Texas has asserted it had made a $539 million investment in cash, labor, land, and materials, which required reimbursement, but the DOE contended that the project had brought about an unprecedented intermingling of federal and state funds without adequate provisions in the original agreement to resolve the matter in case of project termination. To prevent tying up costly computer and physics facilities at the site through years of litigation, the DOE compromised with a $210 million settlement—$145 million in cash and $65 million toward converting an existing accelerator into a cancer treatment and isotope production facility. "This agreement represents a substantial breakthrough which will clear the way for completion of the SSC termination without litigation," DOE Sec. Hazel O'Leary said upon announcing the settlement.

The SSC LINAC was planned for energies of

up to 600 MeV, but before Congress cut funds, only the first piece of the accelerator was finished. Most of the pieces for the 2.5-70 MeV part of the accelerator are in storage; this part will be used for the 30, 50, and 70 MeV energies necessary for the radioisotope production. The proton therapy cancer center requires 265 MeV, and for this part one of the four necessary modules are already constructed. The $65 million would go toward making the remaining components and assembling all for both the radioisotope and cancer treatment facility.

But even with the DOE settlement, the accelerator conversion to a medical-oriented facility is not finalized. Indeed, the Senate's fiscal year 1995 Energy and Water Development Appropriations Act included a $65 million provision for the accelerator conversion (a House bill also included such a provision), but the DOE's agreement actually calls for receiving and reviewing a request from Texas proposing the conversion. An independent peer board will review the project's scientific and medical feasibility before the department will approve the grant, and Texas is responsible for any expenses over $65 million.

Critics of the project are nonetheless concerned about the DOE's expenditures of time and money in the effort. "We're afraid [it] will take away from the NBTF," said Roy W. Brown, manager of regulatory compliance at Mallinckrodt Medical (St. Louis, MO), referring to the DOE's proposed National Biomedical Tracer Facility. "But they [the Texas LINAC] *won't* be doing research and education"—two features of the NBTF which many observers consider valuable.

The Texas Linac would be similar to the NBTF in that both could produce some of the same standard isotopes. But according to Dr. Morgan, the Texas machine would operate at fixed energies and would not be capable of producing the energies necessary for research isotopes. Furthermore, the Texas facility would have no resources for education and research—major features of the NBTF.

Competing with NBTF in the DOE?

"Mallinckrodt and other manufacturers feel there's already enough production of thallium, gallium, indium, and I-123," Mr. Brown said. "So there is not really a need for these." Referring to the Texas project's potential to also supply some of the rarer or "boutique" isotopes, Mr. Brown said that for "the boutique isotopes, we feel there is a need out there. But I hate to encourage [Texas to produce them] because of the NBTF problem. The DOE is not a bottomless pit of money, and if they funnel dollars into this and not into the NBTF, the NBTF would lose."

Mr. Morgan contended that the Texas LINAC would not compete with the NBTF. "There is a lot of misinformation floating around about this, especially among awardees of the NBTF [project definition] studies," (PDS) he said. Although "this accelerator operates at fixed energies" and is not fit for the variable energy needs of research, he admitted that "once the NBTF produces an isotope that's commercially viable, then this facility could produce it" in quantity. Mr. Morgan also noted that, as recipient of one of the five NBTF PDS grants, NTRD had an interest in the NBTF.

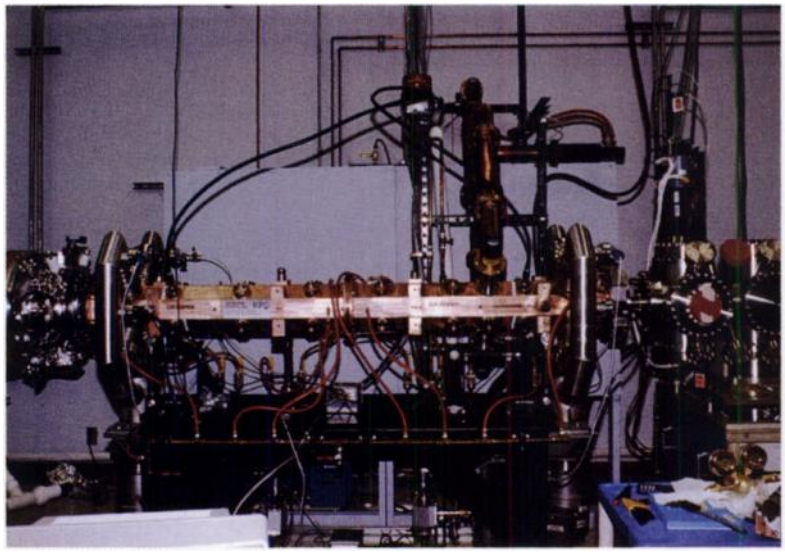

Figure 2. Ion source for linear accelerator at the defunct SSC site.

Without stating that the Texas LINAC project would undercut the NBTF, another manufacturer's spokesman, Carl W. Seidel, production manager at DuPont-Merck Pharmaceutical (North Billerica, MA) expressed some reservations about the proposed Texas facility's market-competitiveness. "It is hard to say if a second supplier would be viable," he said. "If Morgan wants his facility to be commercial, it must have commercial priorities. Whether he can pull it off, we can only see. It's a question of whether his niche will supply sufficient income to keep him going. There's not a worldwide shortage now of thallium or gallium." However, Mr. Seidel added, "If they [the Texas LINAC] becomes a reliable supplier on a cost-effective basis, then we might consider" some form of business agreement.

Other DOE Isotope Programs Proceed

Owen Lowe, director of DOE's Office of Isotope Production and Distribution, hesitated to comment on the department's role with this facility, other than to say it is providing necessary information. But he did reveal that the ongoing DOE

isotope programs were proceeding (see *Newsline*, June 1993, pp 49N and 51N; January 1994, p. 12N). The Brookhaven Linear Accelerator (BLIP) is still on schedule, with some 1994 funds, the upgrade due in fiscal 1996. The BLIP will make the same accelerator-produced isotopes as the NBTF but without the educational and research features; the upgrade will allow the facility greater capacity and longer production runs.

The Los Alamos Meson Physics Facility (LAMPF) is operating now with 1994 funds and still has 1995 funding. Last year, the LAMPF appeared destined for closing (see *Newsline*, June 1993, p. 51N), which would have jeopardized supplies of ^{67}Cu, ^{68}Ge, and ^{82}Sr, the parent isotope of ^{82}Rb, but continued funding has kept the old accelerator opened until alternatives are ready. As to Los Alamos' Omega West project, Mr. Lowe conceded that "from my perspective, it is not going to happen." Omega West had been the department's plan to produce a domestic supply of ^{99}Mo, but safety concerns arose after a reactor coolant loop pipe break, making the facility too expensive for this plan. Instead, "the Annular Core Research Reactor at Sandia Labs looks more attractive" as the preferred reactor for ^{99}Mo, Mr. Lowe said. He is waiting to see if 1995 funds will be available in October 1994 to begin an environmental assessment. Within three to four months of beginning this study, the department should be able to determine whether there will be "no significant impact" on the environment from converting the reactor; and if there is no significant impact, Mr. Lowe said, conversion will take about two years from the beginning of funding. But the reactor "is our new favored son," he said, "and it looks good."

Lantz Miller

LLRW Generators Feel Barnwell's Closure

After the Southeast Compact closed its facility to outsiders, most states are left without a site for their low-level radioactive waste

When the Barnwell, South Carolina low-level radioactive waste storage facility closed its doors to generators outside the Southeast Compact states on July 1, 1994, many of those generators, including nuclear medicine departments, felt the effects of no access to disposal. States of the Northwest and Rocky Mountain compacts still have disposal access, but much of the nation is left in a bind (Table 1). Although there have not been reports of negative affects on clinical nuclear medicine from the closing, research of all kinds has to face new decisions about how much radioactive materials to use in light of growing limits on expensive on-site storage. Many facilities foresaw and planned for the Barnwell closing well in advance but admit that no amount of planning could forestall the problems of having no recourse to permanent disposal.

"We started a long time ago—the early 80's—on massive volume waste reduction, and reduced volume by 95% over the years," said Ed Gershey, PhD, director of laboratory safety at Rockefeller University. But there was still a major effect at his facility—they must store "animal carcasses, because in New York City one cannot incinerate these. So we ended up with a certain amount of animals containing long-lived radioisotopes." Rockefeller University thus had to devise an on-site storage system for animal carcasses contaminated with long-lived isotopes like tritium or ^{14}C in freezers. "That is a long-term commitment," Dr. Gershey said. "Essentially forever"—adding that, luckily, "We are mostly a small-animal facility," so more carcasses can be stored in a given area.

Cutting Back Research

As on-site storage is costly, and space and funds are limited, many research departments in hospitals and other facilities are finding that they have to discourage some research. The radiation safety office of Mt. Sinai Medical Center has to limit the number of long-lived isotopes that researchers can now use, as this facility must store wastes on-site that it has not stored before. According to Rockefeller's Dr. Gershey, "We have been encouraging alternatives to long-lived isotopes. The problem is, there are areas of research that cannot cut back on long-lived isotopes. This becomes a factor that researchers are starting to look at because of the disposal costs for these materials." However, his campus has been "very responsive" to his