

AS RACE FOR SSC NEARS FINISH, DOE SEARCHES FOR CONTRACTORS

To judge by recent actions of the Department of Energy, the last lap is being run in the race for the Superconducting Super Collider.

From April through July, a DOE task force under Wilmot N. Hess, director of the Office of High Energy and Nuclear Physics, called at all seven of the "best qualified" sites. The seven finalists had been selected on Christmas Eve by a 21-member committee formed by the National Academies of Sciences and of Engineering. In deciding on the best sites, the committee had not visited any of the 36 sites in 25 states that entered the competition. Instead, the committee based its choice on the voluminous anthologies of geodetic and demographic data, maps, photos, reports and testimonials that were submitted. Hess's DOE panel, by contrast with the academies' group, spent three and a half days at each site, meeting local officials, examining topographic and geologic conditions on foot and by air, clearing up any remaining questions about the site and getting an earful from both advocates and opponents of the SSC.

On 26 August DOE submitted a draft environmental impact statement for each site to the US Environmental Protection Agency. Coincident with this action, DOE announced the dates for public hearings on the impact reports. Hearings will take place in Michigan and Texas on 26-27 September, in Colorado and Tennessee on 29-30 September, in Arizona and North Carolina on 3-4 October, and in Illinois on 6-7 October. In both Illinois and North Carolina local citizens have raised a ruckus about the giant \$5.3 billion machine. On the same days as the environmental hearings in Illinois, champions of each site will make their cases before Energy Secretary John S. Herrington and the new director of the Office of Energy Research, Robert O. Hunter Jr.

Competition for an operator

In another development, DOE announced in *Commerce Business Daily* on 3 August that a request for proposals would go out later in the month for what is termed an M&O contractor to manage and operate the SSC project. The M&O contractor would be responsible for selecting the architectural, engineering and construction firms that will design and build the 53-mile underground tunnel, experimental halls, laboratory buildings and sup-

port facilities. Competition is expected to be keen for this contract, which will run for the expected six-year construction period and include a five-year option to operate the machine and laboratory. DOE has scheduled a meeting in Washington on 8 September for prospective competitors to learn more about the project.

According to DOE's announcement, the M&O function "requires top quality scientific and management people who are dedicated and committed to the establishment and operation of this national laboratory." In addition to having a track record for building and running a project as massive and complex as the SSC, would-be operators, says the DOE statement, need to meet two qualifications: "1) demonstrate recent significant involvement/association and experience with the US experimental particle physics community and 2) commit to manage/operate the SSC laboratory regardless of the location of the final selected site."

DOE plans to select the M&O contractor sometime during fiscal 1989, which begins on 1 October. Officials at DOE know of only two likely proposers: Universities Research Association Inc., which represents 66 universities as the management contractor of Fermilab and the SSC Central Design Group, and Martin Marietta Corp., which operates Oak Ridge National Laboratory. In the *Commerce Business Daily* statement, the department cautions prospective proposers that Congress has appropriated only \$100 million for the SSC in 1989. While that sum is four times this year's funding, Congress has directed that next year's money is to be spent only on R&D, preliminary design and engineering, and site selection activities, not for any construction work or for any long-lead-time items such as magnet cable and cryogenic systems.

Although \$100 million is considered on Capitol Hill to be much more than a symbolic gesture of good will to particle physics research, President Reagan's fiscal 1989 budget, submitted to Congress last February, called for \$363 million for the SSC. Despite the difference between the request and the reality, Reagan signed the Energy and Water Development Appropriations Act (P. L. 100-371) on 19 July, the first of the 13 appropriations bills that Congress is supposed to pass

each fiscal year.

In its report for the 1989 Energy and Water Development Bill, the Senate Appropriations Committee agreed with proponents of the SSC that the machine is important in maintaining US leadership in high-energy physics and that the committee "would like to make an American super collider a reality. However, the committee simply doesn't know where the money is going to come from to undertake this . . . project. . . . In light of the budget situation for the foreseeable future, the committee believes that the new Administration [which takes office next January] must either find new sources of revenues to finance new initiatives like the SSC or be more successful than the current Administration has been in convincing the Congress to terminate many current ongoing programs to make room for projects and initiatives like the SSC." The report of the House Appropriations Committee said that ground should not be broken for the SSC "until the new Administration has had an opportunity to evaluate the project."

Selecting a winning site

Postponing the start of construction by at least another year has prompted DOE to advise the seven competing states to put off acquiring land for the site. Until now, the DOE schedule required the winning state to begin transferring the first land titles to the Federal government next July. DOE has informed the states the transfer will now start on 1 March 1990. Despite this delay, Herrington has not changed his mind about designating the preferred site shortly after the election in November and selecting the winning site before Reagan leaves the White House on 20 January.

Meanwhile, DOE's High Energy Physics Advisory Panel, meeting in Snowmass, Colorado, on 16-17 July, agreed that the appointment of an M&O contractor is "the most critical issue" for the SSC project next year. That contractor would be responsible for choosing the lab director, who is central to the project, HEPAP members insist, because he will be in charge of recruiting and organizing the senior managers, of deciding on the final design and working with the engineering and construction company, of dealing with Congress and of convincing scientists and ministers in other countries to take part in the SSC project. In fact, after the meeting, HEPAP Chairman Francis E. Low (MIT) advised Hunter that "only a director can responsibly and effectively carry out" all those duties.

DOE has initiated still another exercise to strengthen the SSC. Called the Magnet Industrial Program, it is intended to acquaint interested companies with the $\cos \theta$ superconducting magnets that will steer the colliding streams of protons through the beam tubes. The Central Design Group has

invited prospective makers to attend "show and tell" sessions at Brookhaven, Lawrence Berkeley and Fermilab to introduce them to the design, tooling and production of the magnets. The first session is set for 31 August at Brookhaven.

—IRWIN GOODWIN

BOB NOYCE CREATED SILICON VALLEY AND NOW HE'S ASKED TO SAVE IT

After searching for more than a year for a CEO to run Sematech, the coalition of 14 companies formed to restore vitality to the sluggish US semiconductor industry has found its man. It could hardly have done better. The choice is Robert N. Noyce, vice chairman of Intel Corp.

In 1956, shortly after getting a PhD in physics from MIT, Noyce, the son of a small-town Iowa preacher, joined William B. Shockley, who coined the transistor at Bell Labs, in producing semiconductors for electronics companies. A year later, creating a pattern that was to become familiar in the industry, Noyce and seven others left Shockley Semiconductors Corp to start Fairchild Semiconductor Corp, the firm that produced the first commercial integrated circuit and thereby became the wellspring of California's Silicon Valley.

The selection of Noyce is ironic in that Intel, which he cofounded in 1968 with Gordon E. Moore, a colleague at Fairchild, had supported a different purpose for the consortium than what was finally agreed upon. Intel, which stopped making memory chips three years ago in the face of intense competition from Japan, wanted the consortium to concentrate on ultimately manufacturing commercial quantities of chips to help US makers reestablish themselves in the business. Sematech's main focus, however, is limited to R&D, centering on demonstrating new technology to make the next generation of integrated circuits. The intent is to surpass Japan's production in efficiency, quality and cost by 1990. Sematech's five-year goal is to develop the technology that would enable US chip makers to market chips that could hold 64 million bits of information—64 times the storage of the most advanced chips now available.

Even before it was created in March 1987, Sematech attracted critics. Some argue that the consortium will not do enough for small companies that often take the lead in innovation. Some say the threat of a decline in the US chip industry is overblown and



Robert Noyce: Answering the call

that American chip makers seek government assistance to help fend off the challenge of Japan and other Far East countries in microelectronics. Some point out that similar cooperative ventures have not worked well in the past.

Congress awarded Sematech \$100 million from the Defense Department's fiscal 1988 budget and promised the same amount for the next five years. A similar sum is to come each year from member companies, which include such customary combatants in global electronics as AT&T, IBM, Hewlett-Packard, Motorola, Texas Instruments, Rockwell International, National Semiconductor and Intel. To round out Sematech's \$250 million annual budget, the State of Texas, which houses the organization in Austin, along with universities and other sources, will put up \$50 million per year (PHYSICS TODAY, February, page 51).

While the Defense Advanced Research Projects Agency, which is charged with overseeing Federal support for Sematech, paid this year's installment last spring, and the House had voted an equal sum for 1989, the Senate trimmed the funding to \$45 million on the ground that the consortium, without top executives,

was falling behind schedule. After Congressional leaders learned that Noyce had agreed to take charge, he was privately assured that the full \$100 million was all but in the bag. Congress was impressed also that the same day Noyce took over, Sematech announced that its chief operating officer would be Paul P. Castrucci, a 32-year veteran of IBM. Castrucci ran Big Blue's semiconductor factory in Burlington, Vermont, widely hailed as the equal of any Japanese chip-making plant. He is credited with playing a key role in designing IBM's first solid-state memory devices in 1966.

One of Noyce's first activities for Sematech was to attend a workshop on synchrotron radiation and semiconductor technology at Louisiana State University on 15 August. At lunch that day Senator J. Bennett Johnston, a Democrat of Louisiana, pointedly thanked Noyce for taking the post at Sematech. Johnston, who heads the Committee on Energy and Natural Resources and sits on the Appropriations and Budget committees, described the government's involvement with the alliance of chip manufacturers as "a model we will watch closely as a way of improving the nation's competitiveness in the global market. What we've seen in the Japanese model is that a consensual society can do some things better than a strictly competitive society. . . . The great secret is . . . they [Japanese manufacturers] undertake long-term strategies," while in the US most companies are concerned with sales and profits in the next quarter or the next year. "It is industrial policy in Japan to pool their resources," said Johnston. "And that's what Congress is supporting in Sematech."

As part of this strategy, Johnston noted in his lunchtime remarks, the government would fund more "centers of excellence" at universities, including LSU's proposed Center for Advanced Microstructures and Devices. Johnston was responsible last year for attaching a \$12 million amendment to the Pentagon's appropriations bill to fund the CAMD facility. He assured his listeners that another \$13 million of "pork" legislation would be forthcoming in the 1989 budget. The additional funding would go toward buying a \$19.9 million compact electron storage ring to be made by a joint venture of Maxwell Laboratories and Brobeck Corp in San Diego. The machine is designed to produce high-flux soft x rays for etching densely packed integrated circuits (PHYSICS TODAY, January, page 49).

—IRWIN GOODWIN ■