

# Price tag for accelerator jumps by \$1,000 million

- Panel of physicists called in to provide support
- Machine at old price not worth building

## Washington

AFTER months of rumours, US Department of Energy (DoE) officials have admitted that the Superconducting Super Collider (SSC), the 53-mile-circumference, 20 TeV proton-proton collider, will cost a lot more than previously advertised. But Secretary of Energy Admiral James

that an SSC of 20 TeV will be able to find it. What the DoE panel must decide is how far the energy can be cut without losing the machine's *raison d'être*.

Some panel members have already made their opinions known. "If you miss the Higgs because you went to 17 TeV, that's a tragedy", says Nobel laureate and panel member Leon Lederman. Schwitters also takes a hard line: "Anything below a 10 per cent cut in energy and you get a situation that would be a disaster. And anything better than a 10 per cent cut costs more than \$5.9 billion." Only last month, Watkins said that the \$5,900 million figure was "fixed". "Unless I am told by . . . solid peer review . . . why it needs to be more than that, I don't see any reason to talk about cost increases at this time", he said.

The sudden change not only promises to enliven the SSC's numerous Congressional critics, especially with President George Bush's 1991 budget due out on 29 January, but also raises the ghost of Brookhaven National Laboratory's 'Isabelle' accelerator, which was cancelled in 1983 after construction had begun. By asking the review panel to submit its findings two weeks before the 1991 budget is presented, Watkins' aim is to be ready with a strong scientific message to counter the bad news on the SSC's price, Schwitters says.

The SSC's technical troubles come mostly from its superconducting magnets. The diameter ('aperture') of the beam pipe through which the protons will travel, and the energy of the injector, a smaller accelerator which feeds protons into the main ring, were both predicated on the main ring magnets achieving a magnetic field of sufficiently high uniformity. But prototype SSC magnets have not been performing as well as expected, and to compensate for these shortcomings SSC designers now want to increase the aperture from 4 cm to 5 cm (so that the beam will not hit the walls), and to raise the injector energy from 1 TeV to 2 TeV.

The increase in aperture means bigger magnets, and raises the price by \$300 million. The bigger injector adds another \$288 million. And whereas a 1-TeV injector could be modelled fairly directly on the 1 TeV Tevatron at the Fermi National

Accelerator Laboratory, the world's first and only superconducting proton accelerator, a 2-TeV injector goes to some extent beyond proven technology.

SSC critics find the new cost estimates particularly galling in the light of the rosy picture that has so far been painted by the DoE and the project's supporters. Louise Hillsen, spokeswoman for Representative Dennis Eckart (Democrat, Ohio), an outspoken SSC opponent, says that, only six months ago, DoE told Congress that \$5,900 million was a "lean and mean figure that would stick". And after a foreboding article in the *Washington Post* in November, Representative Joe Barton (Republican, Texas), a staunch SSC advocate in whose district the project will be built, called a press conference expressly to quell fears that the price was creeping up (see *Nature* 342, 465; 1989).

Now even Barton says he needs to "look closely" at the numbers. "I've got an obligation as a responsible Member [of Congress] to make sure they have good reasons for the increase." But he is still willing to fight for a \$7,000 million SSC if necessary. "If [DoE] can really justify it, I think we can sell a \$1 billion increase", he says.

Schwitters, for his part, says that DoE never insisted that he had to build the SSC "as advertised" for the original \$5,900 million figure. "People who have experienced building things in the real world say that this [sort of cost increase] is perfectly normal", he says. But he acknowledges that coming in over budget will "fan the flames" of congressional criticism. And he says that he expects two more hard years of budget battling ahead.

G. Christopher Anderson

## RESEARCH COUNCILS

### New SERC chairman

#### London

SIR Mark Richmond is to be the new chairman of the UK Science and Engineering Research Council (SERC) from 1 October 1990 for five years, replacing Professor E. W. J. Mitchell. Richmond has been vice-chancellor, and professor of molecular biology, at the University of Manchester since 1981, and has also served as chair-



New at the top man of the Committee of Vice-Chancellors and Principals.

This will be the first time a biologist has headed SERC. Richmond's appointment may help to alleviate concern about the level of SERC spending on biological research. £28 million was spent in 1988-89 on research grants in biology, from a total budget for research and administration of nearly £400 million. Peter Aldhous

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REASONS

The Superconducting Super Collider — how expensive?

Watkins is planning to go well armed into the budget battle with Congress.

He has convened a 'blue ribbon' panel of 15 eminent physicists, including five Nobel laureates, to give him support. By 12 January, they are expected to say that a machine downgraded to 17 or 15 TeV would not produce sufficiently good physics results to be worth building.

Watkins' prompt action came after SSC officials told him privately last month that the project could cost \$1,000 million more than the \$5,900 million that had until then been defended as both realistic and inviolable. Although earlier rumours of an impending price rise had been denied by both SSC and DoE spokesmen, SSC director Roy Schwitters now confirms that technical problems with the accelerator's magnets, among other things, will raise the project's price to "about \$7 billion". And he now says that "A machine at \$5.9 billion would be less than 15 TeV, and I don't think that's worth doing".

The single most important goal of the SSC has always been to find the Higgs boson, a hypothetical particle that plays a central role in the otherwise successful unified theory of the electromagnetic and weak forces. Most scientists feel confident