

SDI facing new legal and political hurdles

- Congress votes to restrain SDI spending
- ABM treaty may outlaw even first stage

Washington

THE US Congress is asserting itself in its fight with President Ronald Reagan's administration over the Strategic Defense Initiative (SDI). Last week Congress moved forward on two fronts, cutting spending for research into anti-missile defences, and calling for compliance with the traditional interpretation of the Anti-Ballistic Missile (ABM) treaty which would hinder many tests of SDI technology.

The Democrat-controlled House of Representatives voted to cut the 1988 SDI budget to \$3,100 million, close to half of the \$5,700 million requested by Reagan, and \$500 million less than is being spent on SDI this year. A slowdown in the pace of SDI research is the last thing the administration wants. Despite the recent sober estimate of beam-weapon prospects from the American Physical Society (see *Nature* 326, 815; 1987), the administration is increasingly optimistic that technological problems can be overcome and a missile defence be created. Defense Secretary Caspar Weinberger now says that the first phase could be in place "as early as 1993 or 1994".

That first phase would not consist of 'beam' weapons but of more conventional 'kinetic kill' weapons — rockets and projectiles that would destroy missiles by high-speed collisions. Weinberger has urged the president to approve tests of interceptor rockets as soon as possible. He foresees eventual deployment of 3,000 small rockets stored in some 300 patrolling satellite 'garages' and capable of destroying 10 per cent of Soviet missiles. But the ABM treaty may yet stand in the way of tests.

The ABM Treaty, signed in 1972, specifically prohibits, in Article V, the development, testing or deployment of anti-ballistic-missile systems or components which are "mobile land-based, or sea-, air- or space-based". That would seem to mean that anything more than basic research on SDI technology is prohibited. But this is now dubbed the "narrow" view of the ABM treaty. The "broad" view, favoured by the administration, focuses on an ambiguity in "agreed statements" appended to the treaty, that could be taken to mean that "systems based on other physical principles" (than those known in 1972) are not covered in the ban. All but one of the key officials involved in the original treaty negotiations dispute

that this was what was intended. But a team of State Department lawyers, with access to the secret negotiation record, has just released a new report arguing for the "broad" interpretation.

While President Reagan has yet to commit himself finally to either view of the treaty, Democrats in Congress have been struggling to impose the narrow interpretation. The House has voted to forbid activities that violate that interpretation of the treaty unless warning is given to the Soviet Union that "supreme interests" have been threatened. Things have not gone so smoothly for Democrats in the Senate. Attempts to amend the 1988 Defense Authorisation Bill so that SDI development would be confined to the narrow interpretation, unless a joint resolution from Congress decrees otherwise, has yet to penetrate a cleverly constructed Republican defence shield preventing the matter being brought to a vote. Senator Sam Nunn (Democrat, Georgia), chairman of the Senate Armed Services Committee, has vowed to keep on trying, however long it takes. Two further attempts to obtain a vote will be made in the coming week.

Even if the broad view of the ABM treaty prevails, SDI will still be in trouble, according to Nunn. The 'kinetic kill' vehicles in which Weinberger expresses faith as the first stage of SDI, would not seem to employ "other physical principles" but to be little more than sophisticated interceptor rockets, and in any case, are "mobile land-based" weapons specifically prohibited by the treaty. While the latter objection can be overcome by making the kinetic kill vehicle a fixed system for testing, the former will require some clever lawyers to find a way around.

Given sufficient determination from President Reagan, neither budgetary constraints nor legal arguments over the ABM treaty will slow SDI development. A final budget will be decided by both the Senate and House of Representatives and is likely to be much higher than the House figure. Constraints on treaty interpretation can be vetoed. But with Reagan in difficulties over his administration's involvement in funding Nicaraguan rebel groups, Congress may come to have a greater say in what happens in SDI than it has in the past, and that may mean no commitment to rapid deployment.

Alun Anderson

DoE hopes for superconductor cooperation

Germantown, Maryland

RESEARCH by US industry into the new superconductors is gaining momentum, judging by attendance at a meeting at Department of Energy (DoE) headquarters last week. The two-day event was organized to review the efforts of DoE laboratories on the new materials, and to give industrial researchers a chance to show off their own work. Although there is no sign yet of a coordinated national research programme, the DoE is trying to offset worries about Japanese progress by increasing its visibility as a broker for collaboration between universities, national laboratories and industry.

High current densities, recently achieved in thin films grown at IBM's Yorktown Heights laboratory, provided the major scientific interest. Because the ceramics have strongly anisotropic electrical properties, David Clark and his colleagues grew single grains, about a micrometre thick and up to a centimetre long, so that the crystal plane in which electron pairs travel was parallel to the film. The current density achieved across the planes was as much as seventy times smaller.

Panels of industry and university scientists gave their views on research progress and on prospects for superconductor applications. There was a general note of optimism, despite the acknowledged difficulties in making use of the fragile ceramics. Many participants expressed worries about the chemical as well as the mechanical durability of the materials; the oxides absorb water and carbon dioxide readily, changing the oxidation state of the copper atoms and destroying superconduction. But any difficulty was no sooner mentioned than countered instantly with suggestions for remedies. As panellists emphasized, many fairly obvious and straightforward experiments are waiting to be done, as soon as researchers can find the time.

DoE seems to see its purpose as coordination, not direction. Participants generally agreed that industry will find any research applications under its own steam, and that the role the universities and laboratories could best fulfil is to come up with new materials and theoretical underpinning for their properties. Angela Stacy, of Lawrence Berkeley Laboratory, lamented the lack of strength in solid-state chemistry in the United States; gas phase chemistry and reaction dynamics are perceived as being more intellectually exciting. But the idea that DoE might try specifically to encourage research in certain areas was not enthusiastically received by DoE officials at the meeting.

David Lindley