

Accelerator-based tritium facility to win out over rival US proposals...

Washington. Hazel O'Leary, the energy secretary, is about to endorse plans to build a \$3-billion particle accelerator designed to produce tritium for US nuclear weapons. Some physicists believe the accelerator could also be used for experiments initially planned for the now-abandoned Advanced Neutron Source.

In a long-awaited decision due to be announced within the next ten days, O'Leary is expected to reject proposals to build a nuclear reactor for tritium production. But she will recommend that the use of existing nuclear power stations for this purpose should be investigated as a back-up to the accelerator.

The accelerator decision will provide a critical boost for the Los Alamos National Laboratory in New Mexico, where a four-year, \$300-million research and development programme — including the construction of a prototype — will be carried out as the project's initial stage.

The full accelerator would be built at one of the five candidate sites, including the Nevada test site and Savannah River, South Carolina, where O'Leary may make the announcement on a visit next week.

Tritium, the heaviest isotope of hydrogen, is a component of all the nuclear weapons the United States intends to retain. It decays with a half-life of 12 years, and since the

closure of a previous facility at Savannah River in 1989 the United States has used spare tritium from weapons being taken out of service to replenish its stockpile.

But the Department of Defense insists that a source must be planned now to ensure supplies after 2011. O'Leary, concerned about accusations of being soft on defence issues, has promised Congress a formal decision on the technology and the site before November. She has always favoured the accelerator proposal, as it does not involve building a nuclear reactor.

O'Leary is likely to be strongly opposed by a powerful faction in Congress that backs the reactor alternative. Her decision to back the accelerator follows her receipt of a crucial report on the economics of tritium production prepared by an independent Washington consulting firm, Putnam Hayes and Bartlett (PHB).

The unpublished report found that using an existing civil reactor — probably at Plant Vogtle, near Savannah River — would be far cheaper than either construction proposal. Industry sources say that the report has forced O'Leary to consider the civil reactor option more closely, and that before making a final decision she must decide whether to pursue the civil reactor as a back-up to the accelerator or to research both options fully in a 'dual track' approach to the problem.

The use of a civil reactor for military tritium production would conflict with the traditional separation of military and civil nuclear work in the United States, and — despite its immense cost — the construction of a brand-new facility has heavyweight political support.

O'Leary and other friends of the national laboratories, led by Senator Pete Domenici (Republican, New Mexico), want an accelerator. By contrast, a new reactor, which would cost up to \$6 billion and would also probably be built at Savannah River, is supported by Strom Thurmond (Republican, South Carolina), chair of the Senate Armed Services committee, and Floyd Spence (Republican, South Carolina), chair of the House of Representatives National Security committee.

The reactor is seen by the nuclear industry as its last and best chance of building a nuclear plant in the United States — the first for 15 years. But its supporters received a setback last month, when an attempt by Spence's committee to by-pass the Depart-

...as German reactor faces concerns

Munich. Hazel O'Leary, the US energy secretary, has told the German authorities that she would prefer to see the controversial new research reactor FRMII converted to burning low-enriched uranium (LEU) fuel, rather than highly enriched uranium as currently planned.

But the letter, which reflects O'Leary's concern about the dangers of civilian trade in bomb-grade plutonium, is being played down by the State Department, apparently keen that the United States should not be seen to interfere with the domestic decisions of another country.

O'Leary's statement was made in a letter to Paul Leventhal, president of the private US Nuclear Control Institute. In reply to an enquiry about the US response to the FRMII, O'Leary wrote on 7 July that US efforts to enter the domestic debate in Germany over the reactor would be "potentially counter-productive". But she added that the United States "had expressed to

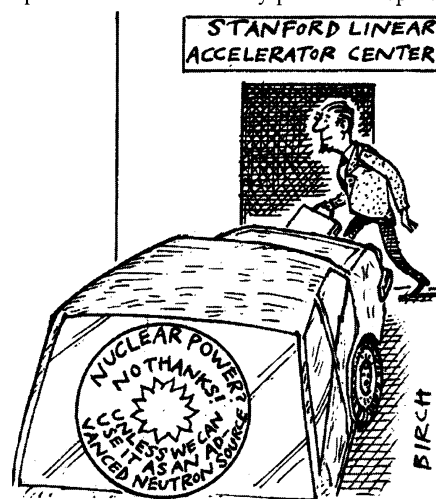
German authorities [the] hope that the FRMII will use only low enriched fuel".

O'Leary added that she had informed Gebhard Ziller, parliamentary state secretary for research, of US concern last September, and had "offered US assistance in redesigning the FRMII".

A spokesman for the Department of Energy (DoE) in Washington says the offer referred to meetings last year of German scientists with researchers from the Argonne National Laboratory who have experience in nuclear fuels of differing enrichment levels.

The DoE spokesman added that the discussions between Ziller and O'Leary had been informal, but also admitted that the State Department had not been happy with O'Leary's letter to Leventhal.

Gert von Hassel, a spokesman for the FRMII reactor programme, says that O'Leary's letter is not an "official diplomatic protest". Despite continuing protest, construction of the reactor is due to start next year. **Alison Abbott**



ment of Energy (DOE) and spend \$100 million on the reactor was attacked as an 'earmark', and defeated on the House floor.

O'Leary was briefed last week on the PHB report, which argues billions of dollars could be saved if the government either paid an electricity utility company to make the tritium in existing plant or purchased an existing power plant outright to produce it.

At the same time, a number of observers, including supporters of the nuclear weapons programme, believe that the tritium facility is entirely unnecessary. According to one former senior official of the Bush administration, there is "no national security need" for the facility, as present stocks will arm thousands of weapons for decades to come, and extra supplies can be obtained from ►

►civil power plant in an emergency.

Anti-nuclear groups are more direct. "This is 75 per cent a 'pork barrel' issue — particularly in South Carolina, where they are scrambling for any jobs programme they can find," says Tom Clements of Greenpeace.

The accelerator would use a high-power version of LANSCE, the existing linear proton accelerator at Los Alamos, to drive protons into a target, producing neutrons which in turn would convert lithium-3 gas into tritium. "The accelerator has a lower capital cost than the reactors, but higher operating costs," says Paul Lisowski, head of the Accelerator Production of Tritium (APT) office at Los Alamos, who admits it would consume a vast amount of electricity — 350 MW, enough for a city of a third of a million people.

Critics say the technology is untried. But reviews by various groups, including a Jason panel chaired by Sidney Drell, the Stanford physicist, have said that it will work. According to Lisowski, the research phase would establish the best target materials, and use a prototype of the front section of the accelerator to iron out any problems with dispersal of such a high-power beam.

Physicists, who were recently deprived of a proposed advanced neutron source of their own (see *Nature* 373, 460; 1995), are now likely to pursue changes in the APT project that would allow it to be used for experiments.

Earlier this year, for example, Burt Richter, director of the Stanford Linear Accelerator Center (SLAC), suggested this idea to Martha Krebs and Vic Reis, the assistant secretaries in charge of energy research and nuclear weapons.

In a letter to the two officials, Richter argued that changes costing "a few hundred million dollars" could provide the United States with "the world's premier spallation source" of neutrons. He also pointed out that, subject to future arms control agreements, tritium may not be needed in the quantities envisaged.

Krebs rejected Richter's plan on both technical and financial grounds. But laboratory officials say that O'Leary's decision to proceed with the accelerator may revive it, and observers feel that the DOE's real problem is its historical aversion to joint civil-military facilities. **Colin Macilwain**

FDA approval allows gene therapy in Japan

Tokyo. The US Food and Drug Administration (FDA) has opened the way for the first clinical application of gene therapy in Japan. Last week, the agency approved the export to Japan of a retroviral vector developed by the US National Institutes of Health and the company Genetic Therapy Inc. (GTI).

Supplies of the vector are due to be shipped this week, and will be used a few days after arrival by a group at Hokkaido

UK Parliamentary panel calls for human genetics authority

London. In a wide-ranging report that is likely to have a major impact on government policies in both Britain and elsewhere, a committee of the UK House of Commons has recommended the creation of a statutory body with broad responsibilities to regulate the applications of human genetics.

The activities of such a body — which it suggests should be called the Human Genetics Commission — would range from advising local ethics committee on research involving genetic screening, to regulating companies offering genetic services.

The committee has also proposed reforms in the way the patent system is applied to genetic information which would, it hopes, maintain the benefits of the system while limiting its potential for abuse.

In particular, while accepting that human gene sequences should remain patentable, it suggests that patent protection should be restricted to a particular application of the sequence — and that the discoverer of a separate application should be eligible for a separate patent.

The recommendations have emerged from an intense eight-month study by the House of Commons Select Committee on Science and Technology, which attracted 161 submissions, and involved over 12 public hearings.

Sir Giles Shaw, Conservative Member of Parliament for Pudsey and chairman of the committee, says the recommendation to set up a statutory genetics authority was a further step along a path that had already involved the creation of advisory bodies such as the Gene Therapy Advisory Committee.

"The scale of the issue raised by the application of genetic science, ranging from questions about patents to the behaviour of

the insurance industry, is, in our judgement, sufficient to warrant a comprehensive regulatory system," Shaw said this week.

The report itself points out that Virginia Bottomley, the former health secretary, recently promised that the government would consult widely on the setting up of a non-statutory committee (see *Nature* 375, 714; 1995). But it adds: "we consider that such consultation has been carried out in the course of this enquiry".

It points out that a "substantial" number of the individuals and organizations that it had consulted supported calls for a regulatory body not only to cover genetic screening — as proposed in an earlier report from the Nuffield Council on Bioethics — but "with wider terms of reference to oversee developments in genetics science."

Reflecting the broad spectrum of political views among the committee's 11 members, concern over the potential misuse of genetic information by insurance companies is tempered by reluctance to impose rigid rules of behaviour. Thus the select committee would give the insurance industry a year in which to propose a form of regulation acceptable to Parliament; only if it fails to do so would a solution be sought by legislation.

But merely highlighting such concern will reinforce calls from pressure groups for government action. Already the Genetics Interest Group, for example, which represents a coalition of medical action groups, has announced plans to use the report to back an amendment to disability legislation currently being debated in the House of Lords; this would give the government powers to act against those found guilty of "genetic discrimination" in employment.

The committee comes down firmly against patents on fragments of genes or on genes of no known function. It also insists that the principle of the exclusion from patentability on the grounds of morality — as stated in the European Patent Convention — should remain.

Its proposed compromise on individual gene sequences is that a combination of a gene and a known, novel and unobvious utility should be patentable "in the context of that utility" — while at the same time "a combination of the same gene and a further novel utility should also be patentable."

Such a formula, committee members hope, both acknowledges the validity of gene patents and restricts the breadth of their potential application, and will thus be attractive to those seeking to resolve conflict. "I hope our report will reassure those colleagues who remain unhappy about the issue of gene patents," says committee member Lynne Jones. **David Dickson**



Shaw: Issues warrant a regulatory system.

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