

ment in achievement of our non-proliferation objectives". Kratzer argued that the US-Indian agreement covering the Tarapur reactor is sufficient to prevent diversion of its plutonium to weapons production. And he warned that if the United States refuses to ship more fuel for the reactor, the Indian government could claim that the original agreement had been broken and that the spent fuel is therefore no longer under safeguards.

Kratzer announced, however, that the State Department is looking into the possibility of taking up the option to buy back the spent fuel which has already accumulated from the Tarapur reactor.

One key issue which surfaced during last week's hearings concerns the extent to which the United States provided aid for the production of India's first explosive device. The Cirus reactor, which provided plutonium for the device, was moderated by heavy water bought from the United States on

condition that it be used only for peaceful purposes.

When Senator Abraham Ribicoff last month drew attention to the possibility that American material had helped India produce its first atomic blast, the State Department demurred. It argued that, by the time the Cirus reactor began producing plutonium for the device, the US-supplied heavy water had been replaced with heavy water manufactured in India. Kratzer confirmed last week, however, that some US-supplied heavy water was probably still in the reactors at the time India used it to manufacture plutonium for the explosive. Consequently, critics of the proposed fuel sale argued that India cannot be trusted to abide by its pledges not to develop nuclear weapons.

The nub of this whole dispute is really that the opponents of the application are arguing that the time has come for the United States to make a public demonstration that it is serious

in its efforts to deter the spread of nuclear weapons, while the State Department is arguing that abrogation of the agreement to fuel Tarapur would jeopardise those US non-proliferation policies. The four NRC commissioners will be hard put to decide which side is correct.

At this stage, it's difficult to predict with certainty what the Commissioners will decide, but at least there is a clue. Earlier this year, there were two applications outstanding for exports of fuel for Tarapur—the 12,261 kg which was the subject of last week's hearings, and a separate shipment of 9,165 kg. Because at least one shipment was required urgently to avoid shutdown of the reactors, NRC approved the export of the smaller quantity on July 2. It did so by a vote of 3 to 1, but explicitly stated that the action would not prejudice its consideration of the second licence application. Its final decision will probably be made in the first week of August. □

IN BRIEF

Stever's appointment

After weeks of uncertainty and delay, President Ford last week nominated Dr H. Guyford Stever to be his science adviser and the first Director of the new White House Office of Science and Technology Policy (OSTP). Stever's nomination must be confirmed by the Senate, but swift approval is expected. The appointment was delayed because four right-wing Republican Senators last month criticised Stever's record as Director of the National Science Foundation and urged Ford not to nominate him for the White House post. The delay has ensured that OSTP will have little influence for several months. The Ford Administration's longevity is in considerable doubt, and with the election in full swing, few people will pay attention to the office. Nevertheless, President Ford can at least claim that he has restored science advice to the White House.

The axeman cometh

The £1,000 million public expenditure cuts announced by the UK Government last week, which are due to take effect in 1977-78, have not left science-related activities unscathed. With the axe falling on capital investment programmes of the nationalised industries, the energy sector (with the exception of the British National Oil Corporation) is particularly hard hit. Coal, gas and electricity will be seeking a total saving of about £70 million through deferred projects. Apart from the

Selby coal scheme, this may involve a 12-month postponement on the Steam Generating Heavy Water Reactor and a cutback on research and development of the fast breeder reactor. A cut of £100 million is being sought from the Ministry of Defence: most of the cuts will be achieved by removing or rephrasing existing programmes, and research work may not escape. At the Department of Education and Science the science budget will be cut in 1977-78 by £5 million. Details have yet to be made known, and it is thought that advice from the Advisory Board for the Research Councils will be sought before final decisions are made.

Geothermal energy research programme

A three-year programme of geothermal research in the UK is to be supported by the Department of Energy following the publication of a report, *Geothermal Energy: the case for research in the United Kingdom* (HMSO, £1.85). The report, by Dr J. D. Garnish of the Energy Technology Support Unit (ETSU), Harwell, reckons that likely returns warrant a modest research programme of collection and refinement of data.

Interest centres on two techniques—the extraction of hot water from aquifers in sedimentary basins or near springs, and the hydrofracturing of rocks, usually granite, with a higher than average temperature. Temperatures likely to be encountered with

either technique are in the 100 to 200 °C range.

Much of the £840,000 involved in the research programme (which ETSU will supervise) will go to the Institute of Geological Sciences for data gathering, particularly in Cornwall, Durham, Bath, Bristol, the Hampshire Basin and the Midland Valley of Scotland. Imperial College and Oxford University are also likely to receive support.

Plea for prisoners

Two scientists, Sergei Kovalyov (Soviet Union) and Sandor Arancibia (Chile) were the subject of appeals by a group of distinguished biologists on the occasion of international congresses of endocrinology and biochemistry in Hamburg recently. Kovalyov, an electrophysiologist, was sentenced in December 1975 to seven years in prison and three years exile for anti-Soviet activities. Arancibia, a neuroendocrinologist, was given a life sentence—he had been a prefect in the Valdivian region before the 1973 change of regime. Signatories included A. Lwoff, F. Jacob, J.-P. Changeux, F. Gros, F. Morel, Y. Laporte, E. Baulieu, J. Nunez, C. Kordon, C. B. Anfinsen, C. deDube, G. Wald, D. Baltimore, R. Dulbecco, S. Luria, A. Szent-Györgyi, J. D. Watson, H. Krebs, H. Temin, J. Axelrod, V. Ramirez, L. Martini and J.-P. Waller. They call on Mr Brezhnev and General Pinochet to free their colleagues strictly for humanitarian purposes since "their lives are in danger and those of their families are broken".