

Nuclear critics set sights on French plutonium pledge . . .

India's spending on R & D falls far behind promises

Munich. The French nuclear fuel company Cogema has offered to store either nuclear waste or separated plutonium for German utilities as an inducement to them not to pull out from long-term contracts to reprocess spent fuel from nuclear reactors.

But leaked details of the offer have prompted a storm of protest from anti-nuclear activists. These point out that Cogema's suggestion would be illegal under current legislation, which requires the plutonium separated from reprocessed fuel to be returned to its country of origin.

The environmental group Greenpeace has demanded an inquiry into the affair, accusing Cogema of negotiating in defiance of French law.

Reprocessing separates the one per cent of plutonium that exists in spent fuel, and this can be used as a component of mixed-oxide (MOX) fuel, which can be burnt in some power stations (see below).

During the 1980s, German utilities signed contracts with Cogema and its UK counterpart British Nuclear Fuels (BNFL) for reprocessing their nuclear waste in the 1990s. Further contracts covering the next decade were signed in 1990. But the political climate has changed considerably since then, and a question mark now hangs over the use of plutonium to generate nuclear power.

In addition, German utilities are no longer obliged by law to reprocess their waste. Last year the auditor-general's office reported that it cost twice as much to reprocess spent fuel as it would to place it into long-term storage, concluding that utilities were being unfairly required to operate uneconomically.

In response to this report, to pressure from environmentalists, and a desire to bring Germany into line with other EU countries, the nuclear law was amended in June to give utilities a choice in how they handle their waste. As a result, they are considering pulling out of their reprocessing contracts.

Withdrawal would, however, incur serious penalties, and these get stiffer each year. For example, if German utilities were to pull out of their contracts with Cogema immediately, it would cost them 10–15 per cent of the total 10-year bill. If they wait five years, they would become liable for 95 per cent of total costs.

The contracts with BNFL are believed to include similar penalties, but as the post-2000 contracts start two years later than Cogema's, there is less urgency.

Preussenelektra, Germany's biggest nuclear utility, wants Cogema to renegotiate more favourable terms. Other companies simply want to cancel their contracts, calculating that if all German companies did this immediately, paying instead for direct dis-

posal, they would make a total saving of up to DM5 billion (US\$3.15 billion).

In response to this pressure, Cogema has tried to increase its attractiveness to the utilities by offering solutions to Germany's perennial political problem of radioactive waste storage.

A leaked document revealed that, at least for Preussenelektra, Cogema has proposed three options: to store spent fuel without obligation to reprocess for up to 15 years, to reprocess it and store the plutonium on French soil, or to reprocess it and pass the plutonium on to a "third party".

But under French law radioactive waste may be stored only as long as is technically required for reprocessing. It must then be returned to its country of origin.

Cogema admits that the proposals were being discussed, and that they would not be permitted under this law — but defends its proposal on the grounds that nothing has been signed. BNFL is not bound by a similar law, and can therefore offer longer-term storage of either nuclear waste or separated plutonium.

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. . . as hopes rise for German MOX factory

Munich. The German engineering company Siemens won an important victory last week when the highest administrative court in Germany overturned previous judgements by lower courts, and ruled that the company can continue construction work on a planned mixed-oxide (MOX) nuclear fuel plant in Hanau near Frankfurt.

At the same time, the opposition Social Democrat Party (SDP) has said that, if it takes office in October's general elections, it is willing to increase its support for renewable energy research conducted by the company to compensate for the promised banning of MOX production.

A spokesperson for Siemens said that the court's ruling would encourage the company to continue its work on the new plant. The plant was originally planned to start operating by 1992, but has been subject to continual delays because of objections from environmentalists.

But the battle is far from over. Challenges to six building and operating permits are awaiting court decisions. And if Germany's political complexion changes after the federal elections in October, the plant is likely to be closed permanently.

The original construction and operating licences were granted to Siemens by Hessen's previous government, led by the Christian Democrats. But when the SDP took office in 1991 in coalition with the

New Delhi. India's national expenditure on research and development (R&D) as a percentage of the gross national product (GNP) continued to fall during 1992–93, according to data published by the Indian Department of Science and Technology (DST).

The country's total expenditure on R&D was US\$1,754 million in 1992–93. In absolute terms, this represents an increase on the previous year. But as a fraction of GNP, the total budget has been declining steadily since 1988–89, when it peaked at 0.96 of GNP per cent.

In 1991–92, this fell to 0.84 per cent of GNP, and it dropped still further to 0.83 per cent during 1992–93. This is far below the proposed target of two per cent contained in a new science and technology policy awaiting approval by the cabinet.

According to the DST report, most of this money still comes from central and state governments. The private-sector share of national R&D expenditure was only 15 per cent of the total, and industry spent only 0.57 per cent of its sales turnover on R&D.

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Greens, each individual licence was challenged, primarily on safety grounds.

In addition, the newly installed Hessen government stopped the original MOX plant in Hanau from operating, and Siemens finally decided to close the plant in April this year (see *Nature* 369, 6; 1994).

German power utilities are now negotiating supplies of MOX — fuel elements that contain plutonium and uranium oxides — from British Nuclear Fuels (BNFL) in the United Kingdom and Cogema in France. Many of Germany's conventional uranium-burning power stations have been adapted to burn MOX to use up the plutonium they produce as waste.

At present, Siemens has the active support of the federal government in Bonn, a coalition led by the Christian Democrats. But the situation will be different if the SDP wins October's elections, as the party is committed to banning the commercial use of plutonium, including the production of MOX.

Siemens has another contingency plan. It has been discussing the possibility of selling equipment from the Hanau plant to BNFL, which is already planning to build a commercial MOX plant at Sellafield in northwest England. Helmut Rupa, deputy director of the Hanau factory, says that Siemens will reopen these talks in the autumn if the threat from the SDP materializes.

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