

## Nuclear Iraq

## Perrin protests

Anxieties about French nuclear collaboration with Iraq have now burst into the open. Last week, the grand old man of nuclear power in France, Francis Perrin, contradicted his government's statements about the supply of a research reactor and highly enriched uranium to Iraq, in a deal to exchange oil for technology. "It cannot be said", Perrin argued in an interview with *France-Soir*, "that the provision of this reactor will not enable a country like Iraq to produce an atomic weapon in a few years' time".

Without addressing the question directly, however, the French government had earlier insisted that its cooperation with Iraq is directed to "perfectly legitimate ends", and that the agreement is also covered by guarantees. The government said it was "astonished" at the accusations that had been made against it, and asked by what principle Iraq's right to nuclear power could be refused.

Perrin, who was president of the Commissariat à l'Énergie Atomique from 1951, and who was confirmed in that post by President de Gaulle in 1960, does not believe that nuclear peace and war can be separated so neatly. He believes it unlikely that Iraq would directly divert any part of the 11-kg charge of 93 per cent uranium-235 to be supplied by France, for this would fly directly in the face of too many international agreements. "But evidently, if Iraq trains personnel with this reactor, they could prepare plutonium by irradiating [unenriched] uranium." This plutonium might be prepared initially for research; then, when they had enough plutonium and technicians, they could break their agreement (under the Non-Proliferation Treaty, which Iraq signed in 1969) not to build weapons.

The controls of the International Atomic Energy Agency — which requires monthly flow-sheets of fissile materials belonging to NPT signatories, and whose inspectors make regular visits to their nuclear establishments — are effective, says Perrin, but a country can always decide to reject them.

Iraq already has a small Soviet reactor, using 80 per cent enriched fuel, under IAEA safeguards. The details of the new French reactor have not yet been received at the IAEA, but the safeguards provisions require that they should arrive more than six months before the reactor is charged with fuel. Charging is, however, unlikely before the end of 1981, the date set before Iraq's chief nuclear expert, Yihya al Meshad, was murdered in Paris on 13 June. It is, however, known that the reactor will be based on the French 50-MW thermal reactor Osiris at Orsay, which takes a charge of 9½ kg of 93 per cent uranium-235. Osirak, the Iraqi version, is planned to be slightly bigger — 70 MW with an 11-kg charge.

Italy is also supplying nuclear facilities to Iraq in exchange for oil, including an isotope laboratory with a hot cell which in principle could be used for reprocessing and plutonium separation but, says the Italian government, it is much too small to have a bearing on weapons production.

President Saddam Hussein of Iraq has rejected all speculation that Iraq may be building a weapon, and has pointed out that Israel is generally regarded as already having the bomb, and has never signed the NPT. "Other countries" said an IAEA spokesman "have been less cooperative than Iraq".

President Hussein, with a \$75,000



*Troubled seer*

million five-year plan, also dreams of a technological transformation of his country, and recognizes that Iraq's principal need is technically trained manpower. He believes that Osirak will contribute to such a pool. Now that Iraq is increasingly turning from its East European and Soviet partners towards OECD countries for technology, it may be wise to take Hussein seriously.

**Robert Walgate**

## Remote sensing

## Going private?

## Washington

Fierce arguments have been generated in Washington by plans under discussion in the Carter Administration to create a fully operational system from the remote-sensing satellites developed by the National Aeronautics and Space Administration.

Few challenge the idea that responsibility for remote sensing should eventually pass to the private sector, but there is disagreement about the pace at which the transfer should occur and the degree of control which the federal government should retain.

Responsibility for coordinating the transfer from NASA to the private sector has been given to the National Oceanic and Atmospheric Administration (NAOO). The NAOO proposes a two-stage

process, involving an initial stage for developing the sensor technology, that would extend to the end of the decade, before a fully operational system would be available for private use.

Several companies, keen to establish themselves in a potentially lucrative market, argue that this time scale is unnecessarily slow. In particular, executives from the Comsat Corporation, which has already successfully taken over responsibility for telecommunications satellites, are arguing that it could start doing the same for remote sensing by 1983.

The temptation to use telecommunications as a model for successful commercial exploitation is strong, but remote sensing is likely to have a rougher ride. The market is undeveloped and heterogeneous.

Thus at a Senate hearing two weeks ago, a spokesman for the National Governors Association said that the remote-sensing system "should be considered in the same context as census, cartographic, geological and meteorological data which are provided as a public service of the federal government".

Aware of this public responsibility, NOAA is considering two ways of allowing federal agencies to buy data under guaranteed purchase contracts. One would transfer responsibility for this entirely to a private corporation, the other would set up a new "for-profit" corporation with both privately and publicly appointed members.

The cost of remote sensing is another problem. According to NOAA administrator Dr Richard Rank, the remote sensing system will probably not be self-financing until the end of the century, and thus will rely on subsidy for the foreseeable future.

But there will still be a temptation to maximize returns, even in the early stages, and state governments are worried that high prices could discourage potential state and local government users from even exploring the potential usefulness of Landsat data, particularly if — as NOAA has suggested — experimental data during the interim period are priced the same as operational data.

Excessive pricing could also have important international implications. Some countries could complain that they are unable to afford information about their own natural resources which can be bought on the open market by multinational mining corporations. The State Department accepts the principle that prices should be consistent for both domestic and foreign users, but warns that price increases should be gradual so that foreign users can adjust to them.

Present users are, however, more concerned at the quality of the service. NASA now has two Landsat satellites in orbit, but both are having problems which have restricted the amount of data being received. Unexpected difficulties have also arisen in the next satellite, Landsat D,

scheduled to be launched in 1982. Development of the instrument called a "thematic mapper", and intended to provide direct information on crop differentiation, is so much delayed that Landsat D may have to be launched without it.

The delays in both technical plans and administrative arrangements have created inevitable frustrations. Those who have already experienced the benefits of remote sensing technology are keen to exploit it as rapidly as possible, and are already hinting that they may look to other countries — such as France and Japan — as an alternative source of remote sensing services. Moreover, some members of Congress claim that the delays reflect a general lack of imagination in the White House about the US space effort.

NOAA is at present working out the details of the transition plan in preparation for its submission as part of the 1982 budget request early next year. It seems more likely to include only limited private involvement — perhaps restricted to processing and marketing the data produced by federally operated satellites.

David Dickson

### Lords committee

## Dumping ahead

The House of Lords Select Committee on Science and Technology embarked on its summer break last week with the promise of a new inquiry in October into the disposal of hazardous waste. The inquiry will be the committee's second quick investigation — the report of the first, on electric vehicles, is due to be published at the beginning of September. A longer investigation of forestry in the United Kingdom will continue until the end of the year.

The suggestion of an inquiry into hazardous waste disposal came from Basildon District Council in Essex, where a large proportion of Britain's toxic industrial waste is dumped. When the House of Commons Select Committee on the Environment declined to take the matter up because of other commitments, the Lords committee stepped in, believing the topic to fit well into its remit of investigating areas of science and technology of public concern.

The worry of Basildon District and Essex County Councils is that there is no coherent national policy for hazardous waste disposal, largely because the relevant section of Part II of the 1974 Control of Pollution Act has never been implemented. The councils also believe that Essex has become a main centre for hazardous waste disposal by historical accident rather than for good practical reasons.

The government has laid down guidelines for dealing with the disposal of hazardous waste but no regulations as to who should be responsible for arranging disposal. The 1974 Act says that local authorities should take that responsibility and should inform



Dumping at Pitsea

the Secretary of State for the Environment of the arrangements they have made. The Act empowers the Department of the Environment to bring these and other provisions (affecting water quality, for example) into force when it chooses. So far it has chosen not to do so, allegedly on the grounds of cost. Redland Purle, Britain's largest waste disposal company, owns the country's largest dump at Pitsea in Essex. The council has power to monitor the sites and has taken measures to restrict the quantities dumped, but it would take other local authorities to take some of the load.

The Lords committee will no doubt be looking at the institutional arrangements for coping with hazardous waste. It also intends to investigate the basis for some of the technical arrangements, for example the criteria used for choosing suitable sites and deciding what can be dumped where. The Select Committee hopes the inquiry can come to grips with new methods of disposal and suggest how more use could be quickly made of them.

Judy Redfearn

### Energy alternatives

## German plans

A West German commission on "future nuclear energy politics", set up two years ago by the Bundestag to resolve the nuclear question, has reached its eagerly awaited conclusions. They are equivocal.

West Germany should shelve a final "decision" on nuclear power until 1990, says the commission. But in the meantime the country should build as many reactors as it needs, provided it makes due effort on the development of coal, conservation and renewable sources.

The all-party parliamentary commission, consisting of seven members of the Bundestag and eight technical experts from industry, environmental groups and the trades unions, considers that it will be impossible to judge — for ten years — whether nuclear energy should be expanded in Germany. The growth rate of electricity consumption, the effectiveness of conservation measures and the impact of renewable energy are too uncertain to make commitments to any particular source.

The commission does however spell out its demands for immediate and increased government powers to enforce energy conservation — the abolition of mileage rates for business cars, an energy tax, more bicycle paths and tighter controls on insulation standards in new homes and factories. The commission also asks for an "energy service" to provide, free of charge, an infrared survey of buildings to show where the heat leaks out. These and other measures have been described by the Christian Democratic Union, the main opposition party, as introducing "a totalitarian energy conservation state".

Elsewhere, the recommendations have been seen as vague and offering all things to all men — especially with the recommendation that reactors should be built if energy demand requires them. The major nuclear construction company in Germany, Kraftwerk-Union, has argued that it will be running out of work in 1983 — it has lost its contract for four reactors in Iran, and there is doubt as to whether Brazil will take up its full option for eight. Thus some suggest that a construction programme of one or two reactors a year over the next decade, a programme similar in its scale to the British, is quite consistent with the commission's view.

At the same time, the report has been interpreted by environmentalists as recommending a further delay in the country's nuclear development. (Germany now has five power reactors above 500 MW electric; in total 15 reactors produce about 9 GW.) It is not surprising that the commission has been represented in the German press as a man wearing two badges, one saying "nuclear no thanks" and the other "nuclear power — yes please".

The forthcoming October general