

Reprocessing (2): Windscale, UK

'The β -in-air alarm is a yodel sound'

Gillian Boucher, recently at Windscale, reports on the reprocessing issue in Britain

PRESS reaction to the leak at the Windscale reprocessing plant in Cumbria have confirmed British Nuclear Fuels (BNFL) in its belief that the media are impossible. The recently reported leak of 100 gallons a day of weakly radioactive water from an old concrete silo containing solid wastes stored in water was discovered on October 10 and its source has still not been identified. But in spite of shrieks about contamination it seemed clear almost from the start that there was probably no danger to the health and safety of workers or anyone else.

There have been allegations of secrecy but the UK Health and Safety Executive is satisfied that BNFL carried out its only obligations in informing the Nuclear Installations Inspectorate after a few days (as the leak was not dangerous there was no obligation to report it immediately) and the unions at the beginning of November. Mr Anthony Wedgwood Benn, Secretary of State for Energy, to whom BNFL is responsible, learned of the leak on December 8 and informed the House of Commons the next day. He later gave the impression that BNFL had improperly withheld information, and is now insisting on receiving details of all future incidents as soon as they occur. But in fact it was the Health and Safety Executive, not BNFL, that was responsible for reporting accidents to Mr Benn, and its rule of thumb has hitherto been that if they are not dangerous he need not be told. BNFL may, therefore, have suffered more than it deserves.

The painful lesson BNFL may now be learning, however, is that it is bound to be accused of secrecy unless it willingly provides far more information than it is statutorily obliged to do. Unless it leaves as wide a margin in its obligation to inform as it does in its compliance with safety regulations the criticisms will continue unabated. In this instance BNFL would have spared itself some insults and probably not lost anything if it had informed Cumbria County Council of the leak, which was discovered while the council was considering BNFL's application for planning permission for a major expansion programme. BNFL's rather lame excuse was that the leak was such a clear indication of the need for new plant

that revealing it could be seen as twisting the council's arm.

Three decisions

Mr Benn's strong reaction is perhaps best explained by the three major nuclear decisions the government will soon have to make, or at least postpone, in the face of rapidly growing public concern. The first is whether to allow the expansion at Windscale that the Cumbria council has provisionally approved: refurbishing the Magnox fuel reprocessing plant, building a new oxide reprocessing plant and assorted research work including development of the vitrification of wastes. Mr Shore, Secretary of State for the Environment, may announce a decision on this this week. The second is whether to build the first commercial fast breeder reactor. Mr Benn is now saying that there is plenty of time to consider this and a decision may not be forthcoming for a year or two. The third is whether to continue with the commitment to use the British steam-generating heavy water reactor (SGHWR) for the next generation of nuclear reactors. At present Mr Benn seems likely to opt for another large coal-fired power station whose cost (£600 million) will preclude development of the SGHWR programme. The SGHWR programme is also threatened by the latest round of public spending cuts which will probably mean delays in nuclear development, and by the Central Policy Review Staff's analysis of the power plant manufacturing industry, released last week, which points out the poor export prospects for the SGHWR.

Mr Shore, having postponed a decision on the Windscale expansion, now has several choices. He can refer the matter back to the county council, call in the matter for his own decision—either positive or negative—or set up one of two types of planning inquiry. The first would consider only third parties affected by the proposals, that is, local people; the second, a Planning Inquiry Commission, would look beyond the purely local issues.

Strong pressure to say yes immediately has come from BNFL management and unions because of £600 million-worth of deals in the pipeline to reprocess oxide fuels from abroad which could be jeopardised by delays. According to

Con Allday, BNFL's Managing Director, prolonged delay would mean disaster. Mr Shore is under pressure from other departments including the Treasury and the Department of Industry not to forego the foreign earnings. Mr Benn in effect gave the green light last March when he permitted BNFL to seek overseas business and to continue negotiations with the Japanese over the reprocessing of their oxide fuel. The government has not authorised the use of resources in this connection, and Mr Benn's recent enthusiasm for answering parliamentary questions embarrassing to BNFL suggests that he has misgivings. Mr Shore's inclination may yet be towards an inquiry, if only because it will be very difficult for him to call in any other planning application if he lets this one go. And the public hostility to nuclear power that has been fanned by the news of the leak is bound to influence his thinking.

Growing controversy

A year ago a decision not in BNFL's favour seemed inconceivable; nuclear power was not the issue in Britain that it was in the United States. Though the questions have remained essentially the same the number of people talking about them has greatly increased; certainly the opposition has had a better press than BNFL. And a shadow of concern on the part of such a body as the Flowers Commission perhaps changes more minds than the clamouring of half a dozen pressure groups.

BNFL insists that reprocessing is necessary for waste management, but for oxide fuels, which can be stored for decades, the requirement is not an urgent one; if the plutonium were not to be used—the controversial question—one eventual possibility might be to reduce the bulk of the spent fuel by removing the uranium and to vitrify the plutonium together with the wastes. Aside from plutonium, it is profits that make BNFL interested in reprocessing now.

The proposed expansion will cost £600 million of which half will be for the oxide plant; but a large part of the capital costs would be met by future customers for oxide reprocessing. The rest is expected to come from retained profits and loans from the private sector; £100 million was raised recently from a consortium of British and foreign banks. As the fuel from the British oxide reactor programme will only occupy 20–30% of the oxide plant's capacity there is plenty of room for those desirable export orders. An important political consideration is that expansion would provide another 1,000 jobs over the next five years to depressed Cumbria. And delays might

cause all this to be lost, possibly to the French or to the Americans, whose moratorium on foreign reprocessing extends only for three years.

But some questions remain to which it is difficult to get a clear answer. BNFL is a partner in United Reprocessors, an Anglo-French-German market-sharing body; just as the French came in on what was originally an Anglo-Japanese deal, it has not been explained what would prevent the British from demanding a share at any time in a Japanese-French deal even if there were a few months' delay for an inquiry. There would be a clause allowing the Japanese fuel to be returned un-reprocessed if the vitrification process were not developed satisfactorily, but a hefty downpayment that had meanwhile been invested in plant would be a lot to ask the British taxpayer to return to Japan. And though the job issue was until recently the one that mattered most in Cumbria, there are suggestions that the latest leak has swung many locals in favour of caution and an inquiry.

The other reason for reprocessing—the development of the fast breeder reactor which will use plutonium fuel—is itself in doubt. Even if the next stage, the CFR-1, goes through, Mr Benn's advisers are taking seriously the possibility that electricity demand will remain pretty much at present levels for the next 20 years and large capital expenditure on power stations around the year 2000 will not be necessary. There is already enough plutonium to fuel one commercial-scale fast reactor, and there are obvious disadvantages to separating out a lot more.

Safety issues

If reprocessing makes commercial sense or is necessary because of the fast breeder programme—both of which are of course hotly contested—there remain the issues of the safety of reprocessing and all that the plutonium economy entails. As far as the safety of reprocessing as an industrial process is concerned, the recent leaks look like supporting the Flowers Commission's remark that BNFL's housekeeping is not all it might be. But BNFL is careful to keep workers' radiation doses a long way within permitted limits; the yodel sound of an alarm is of course but one of an elaborate system of warnings and safeguards. So far nobody has been shown to have died as a result of his work at Windscale (the unions are at present seeking compensation for the families of three workers who have died of various cancers but BNFL is contesting the claim)—a record that few other large industries could claim. Suggestions have been published, however, that a succession of minor accidents with very similar causes shows that the

safety engineers are not learning as much from their past mistakes as BNFL claims.

Radiation levels in the Celtic Sea have caused a good deal of concern. The latest government figures show that the amount of alpha radiation is well within permitted limits but concentrations of beta emitters have risen steeply to reach a worrying 83% of permitted levels by 1975. The most dramatic increase—the tenfold rise in caesium levels in fish between 1973 and 1975—is mainly due to the corrosion of Magnox fuel elements stored for too long before reprocessing and releasing caesium into the cooling water; that should be corrected by the proposed improvements to the Magnox plant. But to increase throughput to the extent envisaged without increasing the dumping of radioactive elements in the sea will surely challenge BNFL's engineers.

Reprocessing oxide fuel is undoubtedly going to be a difficult business with very much higher levels of fission products and plutonium to deal with. Critics point to the 1973 accident at the experimental 'head-end' plant for pretreating oxide fuel which contaminated 35 men, but too much should not be deduced from what happened in a somewhat makeshift extension of the Magnox system; BNFL repeatedly point out that you cannot expect it to achieve the highest safety standards if it is not allowed to invest in new, purpose-made equipment. Many feel that if oxide fuel is to be reprocessed anywhere in the world, Windscale is probably one of the best places to do it.

Other problems, such as the storage of waste and even the protection of plutonium from terrorists, have a large technological component and could probably be solved given time and money. BNFL has suggested that plutonium fuel for fast reactors could for example be mixed with uranium oxide and poisoned with a gamma emitter to make it as unattractive a proposition for a criminal as the spent fuel which is transported unguarded from power stations to Windscale. Plants could be designed to make pure plutonium inaccessible. The unsavoury accompaniment of the plutonium economy, the big-brother surveillance, seems less of an issue in the good-humoured atmosphere of Windscale, where half the workers are locals and twenty-five years' service is not uncommon.

Critics emphasise proliferation

Friends of the Earth, the most persistent and articulate critics of reprocessing, would not accept that these problems are easily soluble, but their main point of attack is over nuclear

proliferation. BNFL complain that Friends of the Earth are always changing their ground: not long ago they attacked nuclear power plants, then they shifted to reprocessing and now they say that Magnox reprocessing is acceptable but oxide reprocessing should be prevented. Friends of the Earth reply that they learn as they go along and "try to find issues with a cutting edge within the general policy framework"—which is pro-conservation and small-scale energy production, rather than specifically anti-nuclear.

On the same side as Friends of the Earth are the myriad other pressure groups and individuals—the Conservation Society, the Lawyers' Ecology Group, Half Life, assorted academics and bishops. Ranged against them, at least in theory, is the establishment: BNFL, their owners the Atomic Energy Authority, the nuclear contractors the National Nuclear Corporation, the Central Electricity Generating Board, even some government departments. Additionally and interestingly, the trade unions have been solidly in favour of reprocessing and expansion. In practice BNFL, being the dirty end of the business, gets most of the criticism and has to put up most of the defence. In between, and supposedly helping in the nuclear debate that Mr Benn favours, are the media, many of which have been a good deal more interested in alarming than informing the public.

Both sides claim the Flowers Commission is with them and those who are puzzled by the delicate path trodden by Sir Brian Flowers suggest that he has changed his mind on reprocessing. Perhaps, as Flowers has said, the difficulty lies in the fact that "beginning with an optimistic view of the science and technology of nuclear power in the normal course of events, [the Commission] ended in such a cautionary fashion towards establishing too quickly the major reliance upon nuclear power that the development of commercial fast breeder reactors is intended to facilitate".

There are certainly plenty of questions to which a planning inquiry could address itself, among them the consequences to Windscale of stricter limits on air and water pollution, the reasons for the difficulties that virtually every oxide reprocessing plant in the world has run into, the feasibility of glassification, the question of design to withstand sabotage and the economics of reprocessing. A Planning Inquiry Commission might also consider the disposal of plutonium. Most of these issues were touched upon by the Flowers Commission but not in great detail. The mere fact that such a list of grey areas can so easily be compiled is now seen as perhaps the strongest argument for an inquiry. □