of the political spectrum.

The Administration has already agreed to support a federal contribution of $123 million towards the almost $1,000 million which it is estimated will be needed to clean up the Three Mile Island power plant. Private utilities have agreed to contribute a similar amount through the Edison Electric Institute, and the rest of the money comes from insurance cover and from the states of Pennsylvania and New Jersey.

The extra costs of new plants is not merely a result of licensing delays. As safety questions come under scrutiny, embarrassing facts are beginning to emerge. At the Diablo Canyon plant in California, for example, the wrong blueprint had been used to calculate potential stresses arising from an earthquake. And almost all of the operating nuclear plants across the country are likely to miss the deadline imposed by the Nuclear Regulatory Commission for replacing between 15 and 40 per cent of their electrical equipment which had previously been thought safe, but which was shown to be liable to failure under exposure to steam and radiation that might occur during an accident.

Such design errors have played into the hands of anti-nuclear protesters who claim that nuclear technology must remain under strict control and supervision. The industry claims that it is being strangled by these controls; but, especially at a local level the courts have tended to back up the critics.

These developments appear to foreclose all but the final NSOC option — that of increasing links with the military sector, perhaps through the recreation of the Atomic Energy Commission which shared responsibility for the military and civilian uses of nuclear fission until the early 1970s. Department of Energy officials, for example, are already claiming that their initial proposals to extract plutonium from commercial wastes through laser isotope separation (*Nature* 30 July, p.401) could partially solve the storage problem.

Here again, however, the political problems are likely to be enormous. Critics argue that allowing the military greater leverage over the civilian programme could threaten attempts to control nuclear technology through more democratic means, and that it would conflict with efforts to limit the proliferation of nuclear weapons in developing nations by trying to divorce the civilian and nuclear aspects of nuclear energy.

Nobody in Washington pretends that finding the solution will be easy, President Reagan has asked Energy Secretary James Edwards and the director of the Office of Science and Technology Policy, Dr George (Jay) Keyworth, to consult industry, the utilities and universities, and they have been given almost a year to prepare a report on "obstacles that stand in the way of increased used of nuclear energy and the steps needed to overcome them".

David Dickson

Human growth hormone
Shortage persists

British supplies of human growth hormone are in danger. Over-optimism about the availability of the hormone from genetically engineered bacteria combined with a failure to appreciate that even mortuary workers are human has left the United Kingdom's National Health Service with supplies which are inadequate for the optimal treatment of the 800 British children with growth hormone deficiency.

Until biotechnology raised the prospect of an alternative, the only source of human growth hormone was the pituitary glands of cadavers. Three years ago at least 50,000 pituitary glands were collected from mortuaries in hospitals and processed in Cambridge. Another 20,000 pituitaries were collected from public mortuaries for processing in London. The combined operation, under the auspices of the Medical Research Council, would have produced more than enough growth hormone for British needs so that up to half of the pituitaries from hospital mortuaries were stockpiled. Because of a drastic fall in the collection of pituitaries from hospitals, the stockpile is now depleted. Faced with a huge rise in cost of the hormone, the Department of Health and Social Security (DHSS) has now ordered a reduction in therapeutic dosage during 1982.

Trouble began when DHSS took over the collection and processing of pituitaries. Most of the hospital pituitaries were to be processed in the department's new Centre for Applied Microbiological Research at Porton Down. Material from public mortuaries, on the other hand, was to be handled by the Swedish company Kabi Vitrum, chosen because it has the European rights to manufacture and market human growth hormone from bacteria genetically-engineered by the Californian company Genentech. Bacterial growth hormone was to have been provided by Kabi Vitrum to DHSS at a preferential price as soon as British clinical trials, due to start in January 1981, had been successfully completed.

The first snag with these plans was that DHSS decided to use the changeover as an opportunity to consolidate into the wages of mortuary workers at hospitals, the small sum that had previously been paid to them for each pituitary collected. As many a manager might have told DHSS, consolidation can be a recipe for diminished productivity. The number collected from public mortuaries has fallen to about 13,000 a year despite the reinstatement of the special payments, but was never more than 20,000. The combined annual collection of pituitaries has therefore fallen by 60 per cent and now provides less than half the amount of hormone needed to treat British children.

The shortfall has been exacerbated by a delay in the production of bacterial human growth hormone. The first batch of Genentech's hormone to be given to humans had unacceptable side effects (fever and the lysis of blood monocytes) and full clinical trials had to be postponed. The side effects were almost certainly due to the presence of bacterial toxins in the hormone preparation, and both Genentech and Kabi Vitrum have now developed a more complex purification process. Genentech claims that its cleaner preparation has cleared toxicity tests and says that it is already six weeks into a clinical trial on children. Kabi Vitrum is slightly behind, having just completed a toxicity trial in Sweden.

Some, however, doubt whether the bacterially-derived human growth hormone will pass through its clinical trials successfully. The scepticism is based on the fact that the bacterial hormone is not quite identical with the authentic human hormone. Clever though Genentech's genetic engineers are, they have not been

Two heads for one

The Centre National de la Recherche Scientifique of France now has its complement of two heads, a director-general and a president, just two weeks after the previous incumbents resigned on a matter of principle. First — as reported last week — the mathematician Jean-Jacques Payan has been appointed director-general; and now M. Claude Frejacques, present director of the Délégation Générale à la Recherche Scientifique et Technique (DGRST) has been appointed president.

The appointments may be interim ones, as the Minister of State for Science and Technology, M. Jean-Pierre Chevènement, is said to prefer a single director for CNRS, rather than the dual headship established by the previous administration. But there was no time to change the constitution before the national colloquium, due in January, where major policy issues will be thrashed out in public, and CNRS — as the major supporter of basic research in France — has to have a clear voice by then.

Nevertheless, the appointment of Frejacques, a career civil servant rather than a scientist, has its rationale. DGRST was effectively the administration of the previous — and less powerful — science minister, Pierre Aigrain, and Chevènement has begun to set up almost a rival administration in his new ministry. DGRST may in the end be disbanded in all but name, with its parts becoming wings of the research ministry. Chevènement already has a chef du cabinet, so some role had to be found for Frejacques. CNRS seemed to suit — now leaving the minister free to shuffle DGRST as he wishes.

Robert Walgate

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