

The select committee, alarmed at the prospect of a *fait accompli* in this most delicate and expensive area of technological development, immediately concerned itself with an inquiry into the choices before the Government. Its air of scepticism in the face of pro-PWR witnesses like Sir Arnold and Lord Aldington has been undisguised, and when towards the end of January an imminent ministerial decision was rumoured, the committee made an abrupt move (with more witnesses expected to testify) to present its report. That report is expected to say, in effect, that the case for buying American is not proven.

Chief among the factors weighing heavily against the American technology was the questionable safety factor of the PWR, with the spectre of catastrophic pressure vessel failure being raised by government scientists (as part of the IPCS case for buying British) and, less graphically if no less earnestly, by Sir Alan Cottrell, Chief Scientific Adviser to the British Government. The civil servants' man pointed out that a failure of a pressure vessel would let loose on "a trusting populace" a nuclear blast with a force equivalent to that of several Saturn rockets. And Sir Alan, in a memorandum to the select committee, indicated that rupture of the steel vessels involved would not admit the inclusion of any fail-safe device and that the vessels might even be subject to failure caused by corrosion or thermal shock induced by an influx of cold water in a loss-of-coolant accident.

Not that the light water reactors have been unduly maligned on their service records; the suggestion was simply that, although they might be tried and tested on a worldwide scale for smallish systems, insufficient work has gone into safety proving PWRs of the size that the British power system requires. The chief selling points of the PWRs, their cheapness and ready availability, also began to look rather sick when the Nuclear Inspectorate let it be known that it had no details of the proposed designs and that it might take two years to approve the designs when it had them. Such a delay, and the cost of any modifications which the inspectorate might think necessary, take away a few of the attractions of the American system as a short term solution.

A further pro-PWR voice, Sir John Hill, Chairman of the United Kingdom Atomic Energy Authority, hedged his bet by opting for middle term British reactors of the steam generating heavy water variety, with fast breeders following. For immediate needs the American system is probably the best bet, he considered, although he held back at endorsing the CEBG's estimate of a requirement of, initially, 18 LWRs and

ultimately, twice that number. The chairman of the select committee, Mr. Arthur Palmer, made a fairly mild assessment of Sir John's attitude when he said he found him "surprisingly indulgent" to the CEBG's United States line.

The TUC, while reserving its right to make a hard and fast decision, appeared distinctly unnerved by the prospect of imported nuclear hardware and asked for meetings with the CEBG. Apart from expressing concern over the safety (or absence of safety) in PWRs, the TUC's fuel and power committee was said to be worried about the effects of an overseas purchase on the long term development of British nuclear alternatives, and also that the CEBG's estimates of nuclear power requirements would fall short of actual demand. It is bound by a Congress resolution that manufacture and construction for an expanding nuclear energy programme should "wherever possible" be British. The committee has received strong representations from trades unionists that this is one of those occasions on which it is distinctly possible.

Perhaps the strongest protest against the CEBG's plan was made by the IPCS which claims 100,000 members, including 8,000 who work in nuclear energy. Like every other anti-PWR voice in the shouting match. The civil servants were aghast at the safety risks involved in buying a reactor design which was introduced only a year ago and is not scheduled to be translated into an on-line operational plant before 1981. Apparently, unresolved safety problems relating to the effectiveness of the emergency core cooling systems and the continued integrity of the steel pressure vessels over a prolonged period have already caused the American Physical Society to ask for an inquiry.

But the crux of the IPCS case was economic. Its line was that a country with a nightmarish balance of payments problem was not doing itself much good if, at one stroke, it managed to run up a heavy bill in licensing fees for a project which is also calculated to hinder Britain's prospects as an exporter of nuclear power technology. The IPCS reckoned that Lord Aldington's estimate of 100,000 to 200,000 for the first stage licensing fees to Westinghouse was a super-optimistic calculation; it would be more realistic, in its book, to talk rather in terms of millions of pounds for the first one or two reactors.

Its proposal, the IPCS confided to Lord Carrington, Secretary of State for Energy, is to press on with AGRs as the major reactor type used for electrical power in Britain and to build at least one steam generating heavy water reactor (SGHWR) in order to open up

an export market in developing countries.

After the AGRs, the aim should be to move as quickly as possible to HTRs as the basis for the next cycle of power stations, according to the IPCS proposal.

For Britain, the evidence of Sir Alan Cottrell seemed to emerge from the welter of conflicting information as straight talk from an upright citizen with no particular axe to grind. His conclusion about the possibility of the gradual growth of a small crack caused by ageing and corrosion in high stress regions of a PWR might be taken for the general view on the programme as a whole: "it needs further investigation".

Short notes

Continuous microtron

A PROTOTYPE continuous microtron (a cyclic accelerator in which the electrons are accelerated by microwaves) has been constructed in Obninsk, as a result of combined research by a number of institutions throughout the Soviet Union. Until now, it has proved possible to operate microtron accelerators in a pulsed mode only, with a relatively low repetition frequency (typical figures are a pulse duration of $1 \mu\text{s}$ and a repetition frequency 100 Hz).

The new continuous microtron is designed to accelerate electrons to energies of 7.5 to 9 MeV with a current beam of up to 2 mA. Thus the power of the beam on the target will be of the order of 15 to 18 kW, considerably greater than with any other type of microtron.

Seismology and power stations

ONE spin-off of the current programme of energy expansion in the Soviet Union has been a survey, carried out by the Academy of Sciences of the Armenian SSR, into seismic activity in the mountains, valleys and ravines of Armenia, with special reference to possible sites for power stations.

The project had two purposes. On the one hand, a team of archaeologists investigated the evidence of earthquake damage in the past; for example, knowledge of the resistance of structures to earthquakes, and the inclination of surviving architectural relics, provides data on the periodicity of earthquakes in the area and the resistance of various local materials to seismic damage. At the same time, a team under Academician A. G. Nazarov studied three reference sites, taking borehole electrical readings to study the vertical profile of the crust.