

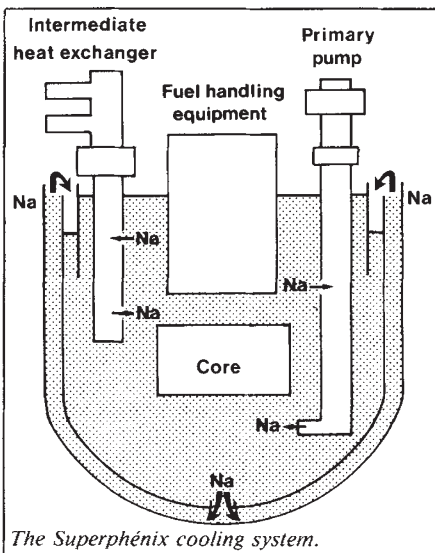
Fast reactors

Superphénix vibrations solved

VIBRATION problems in the primary sodium cooling circuit of the Superphénix European commercial-scale fast breeder reactor "have been solved or nearly so", and will not delay the fuelling of the reactor as had been feared, senior officials at the French Commissariat à l'Énergie Atomique (CEA) said last week.

Thus the 1-200 MW(e) Superphénix, which has been built at Creys-Malville on the Rhône by a consortium in which the French and Italians are the major shareholders, with West Germany third, will still be loaded with plutonium at the beginning of September and produce its first fast neutrons soon after, according to CEA.

The problem now considered all but solved has been with an inner jacket of the main reactor vessel, which is little more than a tank full of liquid sodium, topped up with an inert argon atmosphere. As part



The Superphénix cooling system.

of the cooling circuit, a thin film of sodium passes upwards from the bottom of the main vessel around the outside of the inner jacket, before spilling inwards over the lip of the inner jacket into the core of the reactor. In the first live tests of the cooling system full of heated sodium, the jacket was vibrating with an amplitude of some 12 mm in a diameter of 20 m.

It seems, however, that CEA will now go ahead with the fuel loading without modifying the reactor. Engineers at Creys-Malville have found that a slight adjustment to the sodium flow rate will stop the vibration. The key factor, according to CEA, was the height through which the sodium fell when cascading over the lip of the inner jacket. Initially 100-150 cm, this "sodium fall" has been reduced to 30-60 cm by increasing the volume of sodium in the reactor (by 200 tons) and slightly increasing the flow rate between the inner and outer jackets.

Meanwhile discussions continue in Europe over, first, where to site a planned second fast-breeder reactor, with West

Germany and France the main contenders, and second, where to place a single fast fuel reprocessing plant, with the main contenders being France and the United Kingdom. CEA sources believe that a

Belgian research

Autonomy sacrificed to regions

Brussels

REGIONAL tensions in Belgium are eroding the autonomy previously enjoyed by the quasi-governmental institute for the encouragement of scientific research in industry and agriculture (IRSIA). Hitherto, the institute has been free to select areas and projects for applied industrial research, but now its freedom will be further limited by the latest separate decisions of the fiercely competitive Flemish and Walloon regional ministers to increase their influence on its affairs.

Last month, the president of the Flemish regional executive, Gaston Geens, announced that IRSIA would from now on have to submit projects received from Flemish companies for approval to a commission directly under the control of the minister of economics before funds could be granted. It is also required that one-third of the money available should be specifically set aside for small and medium-sized companies, that a certain amount should also be earmarked for projects specified by the regional executive and that all Flemish companies would have to pay back subsidies obtained from IRSIA when the products of research reach the commercialization stage.

Until now IRSIA has always believed in a system of non-repayable subsidies on the basis of a 53 per cent average participation for regular projects and 80 per cent for first ventures, with success and quality governing future eligibility. The old system remains in force in the Walloon and Brussels regions.

The new Flemish system, it is feared, could have the double effect of wilful under-estimation of results by companies to avoid repayment of the loan and could even restrict technological innovation.

Since 1983, when research was defined in terms of the 1980 Belgian regionalization laws, IRSIA has become used to administering separate coffers (the proportional distribution system was revised in August 1984 to try to give each region its fair share). The major industrial sectors of Belgium — glass, textiles, coal, steel and construction — have not been affected by regionalization, and nor have large companies and collective research centres, but IRSIA previously supported small companies not only with money but also with information on research activities elsewhere. Regional separation has meant that

decision on the site and detailed design of a second breeder is necessary by 1987, and that only France could be ready by that date. The potential purchasers, the French national electricity utility Electricité de France, however, which will probably have a large surplus of electricity by the end of the decade, is not thought to be quite so keen.

Robert Walgate

research activities are suffering both restrictions and overlap. It has also put IRSIA in a very delicate position: it receives applications and oversees projects from all regions but it has to keep information about research developments in each completely separate.

As well as making extra administrative work for IRSIA, the latest decisions also risk fragmenting the applied research effort in Belgium as a whole. This seems ironic at a time when the European Commission, in the Belgian capital, Brussels, is urging the ten member states of the European Community to make easier the mobility of workers, the exchange of information and cooperation on research. Anna Lubinska

Fetal diagnosis trial

CHORION villus sampling, a new technique by which genetic fetal abnormalities can be detected as early as eight weeks of pregnancy, is to be evaluated in a three-year clinical trial run by the British Medical Research Council (MRC). Amniocentesis, the usual method for prenatal diagnosis of genetic disorders, has the disadvantages of being performed later in pregnancy (about 15 weeks) and, because cells have to be grown in the laboratory, the results are generally not available for a further four weeks.

In chorion villus sampling, a sample of placenta containing fetal tissue is removed, allowing immediate diagnosis and much earlier termination. But the technique may be less safe. Preliminary indications (using the 3-400 tests performed so far in the United Kingdom) suggest that the spontaneous abortion rate is 2-5 per cent, compared with 0.5-1.5 per cent in amniocentesis. The randomized trial will include 4,000 women in the United Kingdom and is based on the informed consent of women who elect to join the scheme. Between 10 and 20 UK and European centres will take part; the study will be coordinated with Canadian and US trials. MRC will also follow up the children born after the prenatal trial to assess for any long-term effects of the technique.

Diseases such as Down's syndrome, anaemias, haemophilias and phenylketonuria can be identified by prenatal sampling; soon muscular dystrophies and cystic fibrosis will be detectable as genetic probes become available.

Maxine Clarke