Nuclear reactor safety

Super-Sara's fate undecided

Brussels

Community ministers have again failed to reach a "final" decision on the Super-Sara project at the Joint Research Centre at Ispra in Italy to experiment with loss-of-coolant situations in nuclear reactors. Ever since the project was first proposed after the accident at Three Mile Island in the United States, the Community has procrastinated (*Nature* 11 November, p.99), letting the cost of the project soar.

At last week's meeting, the United Kingdom and West Germany again refused to be placated by Commissioner Etienne Davignon's promises to keep the project within the current estimates of 293.9 million European currency units (ECU) (£161.7 million) up to 1988. Vicomte Davignon, the European Commissioner for Energy and Industry, made a passionate appeal, arguing that it would be irrational to cancel the project when attempts should be made to reassure public opinion over nuclear energy. He recalled that the Western economic summit at Versailles agreed to promote international research into nuclear safety and that there was a danger that, if EEC halted its project, the United States would be unwilling to pass on its own research results.

Davignon held that continuing with Super-Sara would not need extra money apart from an extra 13 million ECU for each year between 1984 and 1987. The extra 27.5 million ECU needed for 1982 and 1983 could be found by transferring resources from another part of the budget. And he thought that by reducing funds for other research at the Joint Research Centres, half of the 39 million ECU needed for the three following years could be found comparatively easily.

The United Kingdom and West Germany were not impressed by this financial juggling and asked whether such a large sum of money might not be better employed in some other way.

The upshot is that a panel of three wise men, independent experts from Denmark, France and West Germany, will review the budgetary estimates and assess the value of the Super-Sara project in comparison with that of similar projects elsewhere. Their report, to be presented at the next research council meeting on 8 February, will also take into account the British delegation's suspicion that Super-Sara will absorb too many of EEC's nuclear scientists in an experiment concerned with coping with an emergency rather than on the prevention of disaster.

In the meantime, the European Commission is to think about alternatives for Ispra if in the end the Super-Sara project is cancelled.

Jasper Becker

Interferon in France

Trial condemned

Paris

Professor Georges Mathé, a well known cancer researcher from the Paul Brousse Hospital at Villejuif, has publicly described as incompetent French doctors involved in preliminary trials with interferon as a possible treatment for cancer. He has criticized the method of administration and the dose and has asked for more information about the circumstances in which four patients involved in the trials died (see *Nature* 11 November, p.97). Mathé has also attacked the establishment where the trials took place and has even asked for the resignation of the members of the scientific council which was set up to monitor the experiments. As a result, the council and IPP (Institut Pasteur Production, the subsidiary of Sanofi-Elf-Aquitaine that produces the interferon) published information about the trials in November. More recently, in a confidential letter addressed to two journalists, they advised wariness of the aggressive tone of Professor Mathé's remarks, which could bring clinical trials of interferon and even

clinical trials in general into disrepute.

Two of the four deaths were from myocardial infarction and another has been tentatively attributed to the same diagnosis, but nobody yet knows for certain what caused them. Professor Flamant, president of the monitoring council, says that it is necessary to keep an open mind about the possible role of interferon. But according to Dr Denis Pouillard, clinical physician at the Curie Foundation who participated in the trials, there was a marked similarity between the symptoms and those he had seen ten years earlier in patients given infusions of leukocytes that had been conserved in poor conditions. Dr Pouillard draws attention to the fact that IPP stores its interferon preparation at 4°C whereas -20°C is generally used for leukocyte interferon storage. He also says that since interferon made up only 1 per cent of the protein in the IPP preparation that was injected, it is likely that proteins other than interferon caused the toxicity.

The accidents gave strength to the supporters of gene splicing methods to produce interferon, which give purer and cheaper products. Professor Flamant, Dr Pouillard and Professor Falcoff at the Institut Curie, who is working with gamma-interferon, all advocate that both methods should continue and their products should be compared simultaneously. They would like to see an international body created to compare clinical trials with different kinds of interferon. At the moment, IPP is performing toxicity trials with the suspect interferon and with a ten-fold purified derivative. If they show that the purified leukocyte interferon is innocuous, clinical trials will begin again, perhaps in January.

Isabelle Trocheris

Toxic wastes blow

Brussels

One of the European Economic Community's hardy perennials has reappeared at the latest meeting of the Environment Council, the battle between the methods used on the mainland of Europe and in Britain for calculating the degree to which industrial discharges of toxic wastes should be restricted. Last Christmas, the British persuaded their partners to include in the directives regulating the discharge of toxic substances into water the "quality objective" method as well as the more strict "limit value" system. The latter sets fixed limits on discharges while the former relates the regulations to the use to which the environment concerned is put.

In the first directive, dealing with mercury, the British conceded that whichever system is used, all new plant must use the modern and effective pollution control equipment.

The second directive deals with cadmium discharges, and the French have been pressing for the British to agree that only limit values should be applied to regulations dealing with new plant. The British claim, however, that this breaks the compromise agreement reached last year.

The issue has now been referred back to Coreper, the committee of the member states' permanent representatives, for further discussion, a considerable setback for the Commission.

Jasper Becker

Jojoba oil

Too late now?

Commercial interest in jojoba oil, once heralded as a substitute for sperm whale oil but since discredited largely because of cost, could be rekindled by a tissue culture technique being developed at Twyford Plant Laboratories in Somerset.

The high price of the oil is largely a reflection of the problems of cultivating jojoba plants. Only female plants produce the oil-yielding nuts and only a small proportion of plants provide a high enough yield of oil to be of commercial value. Attempts to develop the vegetative propagation of high yielding plants have failed because jojoba does not grow well from cuttings.

Now, however, Twyford — part of International Plant Laboratories — and other groups in Israel and the United States have developed a successful approach to propagation by culture of the jojoba's meristem — the growing tip of a shoot or root. The meristem is grown on a series of nutrient media until a seedling develops from it. The seedling is then split into two

or more parts each of which is grown into a complete seedling. By repeating the process a large population of genetically identical plants is produced. And if the starting meristem came from a plant of high oil yield, the population derived from it by meristem culture should also be high yielders.

Twynford has already shipped clonal populations of jojoba to Arizona for field trials, but admits that the project is still in its infancy, not least because there is a five-year time lag before a plant bears its first crop of nuts.

Even if everything goes according to plan and jojoba oil becomes available at a low price, it is by no means certain that there will be a market for it. According to Highgate and Joab, a major sperm oil refiner now concerned with the development of substitutes, had jojoba oil been available when sperm oil was withdrawn from Britain and the United States, its market would have been assured because it could have replaced sperm whale oil in nearly all of its diverse uses. But industry has since become accustomed to using different oils for different processes and today's market will simply judge whether jojoba oil is better than any of these oils for a particular application. The most likely future for jojoba oil now lies in small specialized fields where no other reasonable alternative exists. **Melanie Kee**

Chemical toxins

USA and UN disagree

Washington

The issue of the use of Soviet toxic weapons in South-East Asia remains disputed. While the US State Department continues its campaign to convince sceptics that Soviet toxin weapons have been used in Afghanistan and South-East Asia, a long-awaited report by a United Nations (UN) group of experts has provided only inconclusive findings.

The most dramatic pieces of evidence now produced by the State Department are two Soviet gas masks obtained in "clandestine operations" in Afghanistan. According to the US Army Chemical Systems Laboratory, which analysed the masks, traces of several trichothecene mycotoxins were found on the surfaces and hose connections of the masks. These fungal toxins are said by the State Department to have been used extensively in Laos and in Kampuchea, where "yellow rain" attacks were first reported.

The State Department has also released analyses of blood, urine and tissue samples from 33 alleged victims of toxin attacks; trichothecenes were found in 16 of the subjects. "The finding of T-2 toxin and HT-2 toxin (a metabolite of T-2 toxin in animals) in the blood, urine and tissue of victims of these attacks provides unequivocal evidence of their use as weapons", the State Department concludes.

But in its report to the UN Secretary-General, the group paints a far more complex picture. Most striking is the utter confusion that the group found in refugees' reports of attacks and claimed illnesses. Two Hmong refugees who said they developed a rash after a chemical attack two weeks earlier were found on examination to have three-month-old fungal infections. Some others who attributed their illnesses to chemical weapons were found to have malaria, or in one case, a gastric ulcer. The group also found discrepancies in reports of numbers of fatalities, the colour of the agent said to have been sprayed and the timing and seriousness of the effects. The group's work had, however, been complicated by the denial of access to Laos and Kampuchea and was limited to interviewing and examining refugees who had crossed into Thailand long after the alleged attacks took place.

The most the UN group was willing to concede was that there is "circumstantial evidence" for the use of "some toxic material" in the areas of Laos inhabited by the Hmong. The group found stories of chemical weapons use in Afghanistan less believable, attributing reports there to incendiary weapons (which would give off irritating smoke as a by-product of combustion) and to a harassing agent such as adamsite. And reports of rapid decomposition of the bodies of chemical attack

victims — which have been given prominent attention by the State Department — were "difficult to reconcile with known facts about the effects of chemical warfare agents or other chemical compounds".

Chemical analyses performed for the UN study were likewise inconclusive. Two of the laboratories that analysed blood and leaf samples from Thailand were unable to detect any trichothecenes — even in a control sample spiked with the compounds. A third laboratory reported trichothecenes in all samples submitted, including a blank control.

Furthermore, the possibility of cross-contamination of samples is always present; in addition, the identification of trichothecenes is to some degree a function of the analyst's experience and judgement.

The State Department has tried to avoid argument about its analyses by sending samples to Dr Chester Mirocha, a leading authority on the analysis of trichothecenes. Mirocha's technique is to react samples with trifluoroacetic acid; this produces volatile derivatives of trichothecenes that may then be separated by gas chromatography (GC) and analysed by mass spectrometry. A combination of the GC retention time and the mass-spectrometer peaks can provide "certain" identification, Mirocha says, with a detection limit of less than one part in 10^9 . The blood and tissue samples that he analysed contained trichothecenes in the range $10-100$ parts in 10^9 .

Mirocha points out that even among workers in laboratories with a great deal of experience, quantitative results of trichothecene analyses can vary by as much as 30-60 per cent; in experienced laboratories the variations would not surprisingly be much greater, he says. "Some people have come into this entirely cold. Just because they're chemists doesn't mean they can automatically analyse for trichothecenes", says Mirocha. The UN group used laboratories at the Tokyo University of Science (run by Dr Y. Ueno, who, along with Mirocha, is considered to be one of the world's experts), the University of Veterinary Medicine in Vienna, and the Technical Research Centre in Espoo, Finland (see *Nature* 16 December, p.569).

But reliable as Mirocha's analyses may be, several independent experts question seriously what exactly he has been analysing. The gas masks, for example, were first analysed at the Army's laboratory; Mirocha was sent only a chloroform extract and asked to confirm the presence of T-2. Mirocha says he was also sent a piece of rubber or plastic on which he was unable to detect any of the toxins.

The State Department refuses to say how the masks were obtained, and independent verification of their origin and handling is

Cancer prize

Washington

The Hammer Prize Foundation has awarded its first \$100,000 prize for cancer research to Dr Ronald Levy of Stanford University and George Stevenson of the University of Southampton (in Britain). They were cited for their work on monoclonal antibodies in the treatment of B-cell leukaemia and lymphoma.

The prize, which will be awarded annually for ten years, was established by Armand Hammer, the chairman of Occidental Petroleum. Hammer has offered an additional \$1 million for a "cure" for cancer similar to the cure for polio achieved by Dr Jonas Salk. The annual prizes are for the scientists who have made the "greatest contribution towards a cure".

The prize has stirred a certain amount of controversy, both for its origins and for its terms. Some researchers question its focus on treatment, rather than basic research, saying that such an emphasis encourages "premature jabs". And there has been grumbling, too, about Hammer's ties with Occidental, the parent company of Hooker Chemical of Love Canal fame. Hammer's appointment to head the President's Cancer Panel — previously a panel of medical experts — had earlier provoked similar criticisms. **Stephen Budiansky**