Nuclear equipment

Secrets lifted

Washington

US physicists concerned that their work may become subject to national security restrictions because of its potential military value to foreign powers will soon have a public list to turn to for guidance. The list should also be an invaluable guide to foreign governments wishing to find out what the United States considers sensitive in nuclear technology.

The main purpose of the list will be to provide officials in the Department of Commerce with guidance on what controls should be applied to technology exports in sensitive areas such as nuclear energy. The full list is being drawn up by the Department of Defense, as required by the Export Administration Act of 1979. Last week, as part of this exercise, the Department of Energy (DoE) published in draft form a table of what it calls "energy-related militarily critical technologies".

Details are given of the major components of all technologies related to the exploitation of nuclear energy, from nuclear fuel processing and fusion reactors to security techniques. For each "critical" technology, the department identifies "keynote hardware" necessary for its successful implementation. It describes not only the military and the civilian uses of the technology but also the foreign countries in which there is evidence that the technology is currently available.

The proposed classifications are only preliminary, and are open to public comment so that a more refined list can be produced. The department hopes that the list will be valuable in calling attention to areas of concern, but publication of the list may also prove to be controversial. Some countries, particularly in Europe, have previously argued strongly that as much information as possible about the components of nuclear technology — particularly those relevant to its military

applications — should remain secret. They claim that publication could provide a shopping list for non-nuclear countries interested in obtaining nuclear weapons, making the job of limiting proliferation more difficult.

Department officials said last week that all the information in the list had been taken from the open literature. They claim that, although they have indicated where a country has the capability to develop a technology, this does not imply that it has done so, since much of the information was inferred from data reported in the scientific and technical literature.

The table accompanies a broader but less detailed list of militarily-sensitive technologies published in the Federal Register on 1 October by the Department of Defense. Its publication stems from recommendations made four years ago by the Defense Science Board that, if the United States wanted to restrict the export of technologies which might later be used against it, this might be achieved most effectively by shifting the focus of control from end products to the set of "critical technologies" on which the development of these products depended.

To those who might complain that the list is giving away information that could be useful to a potential nuclear power, the department points out that it has not listed many "black arts" or tricks of the trade which cannot be listed as keynote hardware, but may be just as essential to the proper operation or equipment.

The table was compiled in the framework of legislation aimed initially at increasing trade with the Soviet Union and other Eastern European nations: a revised approach was recommended as a way of doing this without sacrificing national security, by placing controls on know-how rather than directly on hardware.

Since then, however, federal policy has been pushed in two other directions. One has resulted from the decision to restrict high technology exports to the USSR following the Soviet occupation of

Afghanistan. The other has been fall-out from the *Progressive* case, where a court agreed that once information has been made publicly available it can no longer be considered classified for legal purposes.

The result has been a schizophrenic desire to tighten restrictions in one direction and loosen them in another. The resulting ambiguity caused an overzealous State Department official earlier this year to prevent a postgraduate scientist studying in the United States from travelling to San Diego for a conference on fusion technology.

David Dickson

European rockets

Range reprieved

The European Space Agency's rocket launching ranges have been reprieved, at least for a further five years. But they will now have to operate on a reduced scale. This was the chief outcome of the meeting last week of the agency's Scientific Programme Committee, at which the representatives of France, West Germany, Norway and Sweden undertook to provide 80 per cent of the cost of operating the two rocket ranges in Sweden and Norway.

The meeting was marked by a further attempt by the United Kingdom to reduce its commitment to the two ranges, at Kiruna (Sweden) and Andoya (Norway), at present estimated to be £1.8 million a year. Although originally a principal partner (with West Germany) to the tune of 40 per cent of the cost, Britain has been reducing its contributions since 1977, largely on the grounds that its need has been reduced since the ending of the Skylark programme.

Last week, the British representatives appear to have startled their partners by suggesting that, from the end of 1980, the British contribution to the total budget of the ranges should be reduced from 20 per cent to roughly three per cent, with a time limit of only three years.

The proposal was not formally accepted at last week's meeting, but will now be put to the Council of the Space Agency for a final determination. Switzerland and the Netherlands also offered last week to continue their contributions at about two per cent of the total, but declined to sign the protocol that would have ensured full operation of the two ranges.

The Science Research Council (SRC)'s position appears to be that its need in the past three or four years has been to launch about six or seven Petrel rockets each year, and that rocket launching facilities in Canada and Alaska can be used on a one-off basis more cheaply than the average cost of the European subscription. Contributing members of the European organization, known as ESRANGE, are required to pay a fee for each rocket launched in addition to their subscription, and neither of these costs includes that of the rocket or of the equipment which it carries.

Judy Redfearn

Table Critical elements in nuclear fuel cycle technology — DoE

A.	Critical technology	Military use	Civilian use	Foreign availability
	Uranium enrichment	Nuclear weapons	Power reactors, research reactors	—
(i)	Gaseous diffusion	—	—	UK, France, USSR, FRG, Netherlands, China, Sweden, Switzerland
(ii)	Gas centrifuge	—	—	USSR, UK, Netherlands, FRG, Japan, France, Pakistan, Australia, Italy, Switzerland, Sweden, Brazil
(iii)	Laser isotope separation	Separation of fissile isotopes	Purifying materials	Canada, France, FRG, Japan, South Africa, UK, USSR
B.	Reprocessing technology	Nuclear material production	Power reactor fuel cycles	Belgium, France, FRG, India, Italy, Japan, Taiwan, UK, USSR
C.	Heavy water production	—	Power reactors	Canada, France, USSR?, Norway?, India, Argentina
D.	Fuel fabrication	Nuclear propulsion, nuclear materials production	Power reactor fuel	France, USSR, Canada, FRG
E.	UF ₆ production	Feed for enrichment plant	Feed for enrichment plant	USSR, France, FRG, Belgium, UK, Japan, China, South Africa, Italy, Canada