manufacture based on high-density semiconductor devices, software productivity and packaging — the optimal packing of microcircuits on semiconductor chips.

Similarly, the scale of operations has not yet been decided, although an annual budget of more than \$50 million was talked about last August. Admiral Inman said on the telephone last week, however, that he had received assurances from the member companies of their commitment to the enterprise, and that the next few months should show how well they deliver.

Inman's special value to the enterprise will be his experience in the development of large computer systems for the National Security Agency and his reputation for leadership. But MCT says that he has not been hired as a "government contract-broker" although there is a possibility that the company may qualify for research and development grants in its field. □

PWR league table

Germany tops

GERMAN pressurized water reactors (PWRs) are the best in the world, except for isolated stations in small countries such as Switzerland, according to a UK study by the Science Policy Research Unit (SPRU) at the University of Sussex. The study, compiled by SPRU researcher Steve Thomas, compares plant availability (actual energy generated divided by theoretical maximum) for 1978–81.

West Germany, with six operating PWRs in 1981, turned in an average availability of 79 per cent that year — compared with 57 per cent in the United States and in Japan. However, Germany's six boiling water reactors (BWRs) did much worse: 43 per cent in 1981. French PWRs in 1981 fell mid-range at 67 per cent.

Among suppliers, Westinghouse did best with its two-loop (500–700 MW) PWRs: 75 per cent. But its three- and four-loop PWRs (over 1,000 MW, like Britain's proposed Sizewell design) showed consistently less than 60 per cent. The key problem was steam generator failure, which the German modifications of the Westinghouse design appear to have solved. A second supplier, Babcock & Wilcox, "have a poor record" even apart from the Three Mile Island accident.

Among reactor types, the unchallenged lead is held by the Canadian heavy water reactors (CANDU), which were precision engineered to save costly heavy water. The eight CANDUs in operation in Canada showed availabilities of nearly 90 per cent in 1981, and one in Argentina 94 per cent.

These figures raise new issues of competition for reactor vendors in the world market, says Thomas. In the previous period of large ordering (1967–73) utilities based their orders on promise of performance. Now they have real figures on which to make their judgements.

Robert Walgate

Consent in clinical trials

Will verbal assent suffice?

RULES for obtaining patients' consent to participate in clinical trials at one of Britain's leading teaching hospitals will soon be altered if the institution's ethical committee gets its way. But, according to the *Acton Gazette* last week, the hospital's governing body is resisting a proposal to replace verbal by written consent.

The Hammersmith Hospital's Research Ethics Committee had suggested some months ago that present procedures for obtaining consent, which involve the patient reading and signing a stark clinical description of his or her condition, might in certain cases cause unnecessary distress. It recommended that when consent is being sought from patients with cancer or malignant blood disease, a "sensitive" verbal explanation of the proposals should be used instead, and that the patient's oral approval, witnessed by a disinterested third party, should suffice as evidence of consent.

The proposal, later modified so that a written copy of the oral explanation would also be made available to the patient, has now been given a cool reception by the Hammersmith Special Health Authority, which apparently felt that if a written copy was to be made available, the patient might as well be asked to sign it as confirmatory evidence of consent. The proposal has been referred back to the ethical committee, to the annoyance of some members of the medical school.

Legally, informed consent has to be obtained from any patient participating in a clinical trial, and the British Medical

Association's Handbook of Ethics stresses that "as full an explanation as possible" should be given to potential subjects. Guidelines issued by the Medical Research Council require "consent freely given with a proper understanding of what is proposed" for clinical trials. But the consent does not have to be in writing, although this is usually considered desirable.

So have the committee's proposals come full circle? Not quite. If the ethics committee is able to satisfy the health authority's criticisms, the patients concerned will first receive a verbal description of the proposed trial from their own doctor which will be couched in "appropriate terminology". The written consent requested by the health authority will be based on that description rather than on a bald medical one.

Professor John Goodwin, chairman of the Research Ethics Committee, says that the proposals would not significantly alter the number of patients participating in clinical trials (most of those asked agree anyway) but that they would give seriously ill patients more peace of mind. But some still have doubts. Special Health Authority chairman Mr Christopher Bland said: "We fully appreciate that the motive behind the proposal was to spare terminal cancer patients the possible mental suffering caused by very stark written explanations. But at present the absolute clarity of understanding required before getting informed consent to taking part in clinical research might not be achieved."

Tim Beardsley & Martin Flanagan

UK industrial research expenditure and jobs

WHILST employment in the research and development sector of British industry has fallen since 1978, expenditure has merely levelled out, according to figures published by the Confederation of British Industry (see figure). But there are sharp differences between individual industries. Thus spending has increased in both the chemical and electronic industries but has been markedly reduced in the automobile industry.

Industrial expenditure on research and development

Sector	1978	1979	1980	1981	1982
Vehicles (incl. aerospace)	94	97	100	94	-
Chemicals (incl. petroleum products)	98	98	100	101	-
Electronics	93	102	100	107	-
Food, drink, tobacco	99	97	100	99	-
Total	95	99	100	99(100)	-

Source: R & D — in recession too?; CBI, London, 1983. The 1980 value is taken as 100 per cent.

The CBI report finds little encouragement from comparison of Britain's present spending on research with that of other industrialized countries. After only weak growth during the 1960s and 1970s, the British research budget remains less than half that of West Germany and still lags well behind that of France. Melanie Kee