

NUCLEAR POWER

LWRs Are Coming

ONLY by building light water reactors (LWRs) bought from abroad can Britain be sure of a supply of nuclear generated electricity on time, Sir Arnold Weinstein told the Select Committee on Science and Technology this week. Sir Arnold, who is managing director of GEC, the company that holds half the shares in the National Nuclear Corporation, told the committee that since March when he last gave evidence to the committee he had come to the conclusion that the British designed advanced gas cooled reactor (AGR) "does not provide anything like the necessary security of supply". Five AGR stations are under construction. All of them are overdue.

Sir Arnold said that last March he had hoped that it would be possible to build a series of AGRs. But the difficulties with the stations had not been resolved. "This is rather worrying if you are contemplating a programme that will depend on good delivery dates."

Nine countries are building light water reactors and stations totalling 250,000 MW are on order. From 1974 it is expected that 50,000 MW a year of light water reactors will be ordered. There is much more experience of these reactors and there is obviously a worldwide market available, he said.

Sir Arnold confirmed that if the government does decide to allow the Central Electricity Generating Board to order light water reactors, the first station will come, at least in part, from the United States. The steel pressure vessel and the steam generator would be imported along with various other high quality components. About 20% of the cost of the first station might be spent on imports. For the second station the percentage would be lower, although it is possible that even for subsequent stations the pressure vessels will continue to be imported. But the pressure vessel only costs £2 million out of £150 million for the complete station.

Sir Arnold emphasised that the imported parts need not come from the United States for stations after the first one. France, Holland and Germany all have facilities to manufacture LWR parts.

Asked if importing United States reactors would not be a body blow to British advanced technology, Sir Arnold replied that further development work on nuclear systems — including the light water reactors — is still needed and Britain can contribute to this as part of an international programme. He also agreed that a commercial high temperature reactor of about 1,300 MW should be built.

On the question of safety, Sir Arnold

said that the doubts raised in this area were the one inhibiting factor. But the Central Electricity Generating Board has made careful studies of the light water reactors and they are satisfied, he said. Sir Arnold added that as far as he could tell most of the safety questions had been dealt with or were being dealt with satisfactorily except the possibility of the pressure vessel fracturing. But most experts in Britain and the United States are satisfied that the vessel is safe, although doubts have been raised recently. "I would not for a second advocate that we should have a programme of nuclear machines or any other machines that would put the public at risk."

Buying light water reactors would not remove all possibility of building gas cooled stations, Sir Arnold said. If there were a serious accident with light water reactors anywhere in the world that necessitated ending a British light water programme we could always return to AGR stations or to Magnox. Magnox stations have been considered for this programme, but the cost and the need to redesign them extensively (which would again introduce the problems of building prototype plant) led to their fall from favour.

ENGINEERING

Unhappy Lot

ENGINEERS, it seems, are not very happy people. Underpaid, under-recognised, and belittled beside their European counterparts, the 300,000 strong profession in Britain is eager to have its wrongs righted.

That at least was the impression given last week when the Council of Engineering Institutions (CEI) published the results of a survey of 27,000 of its members.

Mr B. Hildrew, a former chairman of the Institute of Marine Engineers and the director of the survey, said that the income of engineers has only risen 1.5% in real terms since 1966. "Considering that we are a technological nation this must be a serious warning."

The CEI also collected, among the welter of statistics on numbers employed in each industry, salaries earned and fringe benefits received, an estimate of the satisfaction felt by engineers with their jobs and prospects.

On the whole, the survey shows, two out of three engineers are well satisfied with life, but in certain industries, notably machine tools and gas distribution, engineers are unhappy with the current situation. And in a number of industries—particularly machine tools, some mechanical engineering, the aircraft industry and vehicle manufacture—some engineers are disenchanted with their career prospects.

On the continent, the CEI maintains, engineers are paid better and have a higher status.

The survey also reveals that the percentage of engineers under the age of thirty has fallen, reflecting the relative lack of interest in the subject at undergraduate level in universities. But the under-thirty intake now includes a very high percentage of graduates, as the engineers are gradually turning themselves into an all-graduate profession. From 1974 all new entrants to institutional membership will hold graduate or equivalent qualifications. In 1966, graduates were outnumbered two to one by non-graduates among members of the institutions. Now the figure is one to one.

The number of engineers in research and development has declined as engineers are transferred into production and construction work to meet the demands created by economic expansion. Members of the CEI see this as a welcome and productive change.

Immaculate Hanker

Received recently in a British university:

Dear Sir,

With due respects and most supplicably I intend to bring the matter under your consideration that I have the honour of seeking admission in your institution to complete the MS(Physics) degree course there.

I am very much interested in pursuing higher studies from your esteemed university. It has been my lifelong ambition to do MS and advanced research in the field of science from a university of a technologically advanced country. I conceive an immaculate hanker to achieve a chance to complete this course in your highly esteemed institution and if in some way, I get admission there, it will be an affair to stimulate me to an inexplicable exhilaration.

I shall very much appreciate your help in securing for me some sort of financial assistanceship in the form of a Fellowship, part-time job or as you may deem fit. In return I have nothing to offer except hard work, full cooperation and everlasting indebtedness towards you.

Perhaps this will be an adequate information I am required to give. I hope you will entertain my long cherished ambition in exorable way, and I am waiting an optimistic expectation for an adorned favourable reply from you.

Yours obediently

Unemployment among engineers has halved to 0.52% over the two years since the CEI's last survey, while the general distribution of engineers throughout industry has not changed much. The massive recession in machine tool manufacture in 1971 has halted, although there has been no appreciable recovery, and the percentage of engineers employed in electrical equipment manufacture and in electricity generation or distribution has dropped. Since 1971, consultancy has taken over from electronics as the largest single employer of engineers (about 10%).

The survey also reveals that engineers who earn more than £3,000 a year also on average receive the equivalent of a further 20% of their salaries in fringe benefits.

Short Notes

Alternative to Hexachlorophane

A NEW disinfectant-detergent preparation for use as a surgical scrub in place of hexachlorophane has passed its first reported independent field trial with flying colours. Hibiscrub, a chlorhexidine detergent solution, marketed by ICI, has been tested by an operating team in the professorial surgical unit at Aberdeen Royal Infirmary, and its findings are reported in a recent issue of the *British Medical Journal* (4, 586; 1973). The unit had previously used the hexachlorophane preparation PhisoHex successfully for many years, but this disinfectant is not entirely satisfactory as it has a fairly narrow range of activity and there is accumulating evidence of the possibility of its toxic absorption. The trials showed that Hibiscrub was just as effective as PhisoHex in maintaining low levels of bacteria on the hands during operations and as an added bonus was more pleasant to use and also cheaper.

The members of the Aberdeen team have acted on their findings and now use Hibiscrub as their routine surgical scrub.

Name Dropping

QUEEN'S University, Belfast, is sometimes embarrassed by the 'Queen's' part of its title and often drops the word from its advertising copy. But there is no sinister motive behind this. The true explanation is more mundane. A spokesman for the university said recently that "when our advertisements are classified alphabetically under 'Q' our prospective applicants sometimes get tired before they get to us". This alteration to the name applies only to publications outside Northern Ireland.

At home they stick loyally to the full title.

BRITISH COUNCIL

Looking East

CONSOLIDATION was the keyword in 1972 as far as the British Council was concerned. The council's annual report published recently (available from 65 Davies Street, London W1Y 2AA) emphasises that the purpose of the council has remained unchanged since it was established forty years ago. It is still in existence to "make the life and thought of the British peoples more widely known abroad . . . to enable students from overseas to undertake courses of education or industrial training in the United Kingdom . . . to bring other peoples into closer touch with British ideals and practice in education, industry and government . . . to make available to them the benefits of British contributions to the sciences and to technology . . ."

The latest people to benefit from the attention of the council are the Chinese from the People's Republic. During 1972-73 there was a marked increase in the council's contacts in China and many Chinese came to Britain last year to study English. Recently, the council has, acting as an agent for the British Government, placed sixty Chinese post-

graduates in science, technology and medicine in one-year posts in Britain. These people are mostly between the ages of thirty and forty-five. The first few have already arrived and are in the process of learning English. They will start their scientific work in January.

The council's budget for 1972-73 was £20.51 million, of which £18.98 million was covered by a parliamentary grant. The remainder came from earnings and private donations. For 1973-74 the budget has only increased by a modest £234,000. About 20% to 25% of the budget is spent on science although the accounts do not allow a direct extraction of this sum.

The council at present employs eighty-one scientifically qualified officers but not all of them are in posts directly associated with science. Fifty-seven of them are abroad and twenty-four are in Britain, most of them in London at the head office.

In the past two years the number of science officers in Europe has doubled. Until 1972 the council had science officers in Spain, Italy and Germany. During 1972-73 a science officer was assigned to the Paris office and recently one science officer has been appointed to Scandinavia and another to the Benelux countries.

DEAFNESS

Wiring for Sound

STUDIES are in progress at the Institute of Sound and Vibration Research at the University of Southampton on the possibility of implanting electrodes into the inner ear to restore hearing in cases of deafness where the auditory nerve is undamaged but the cochlea no longer works.

A feasibility study has been carried out for the Medical Research Council (MRC) by Dr A. R. D. Thornton and Mr N. V. Morgan, both members of the institute.

A number of electrode implants have been carried out in the United States. These have only picked up low frequency sounds and have not helped much in the hearing of speech. But lip reading has been made easier.

The Southampton studies will assess the possibility of plugging a number of electrodes into the cochlea so that a fuller range of hearing can be restored. Dr Thornton says that the operation is already possible with existing technology, although many questions have to be answered before it is certain that the technique can be used.

Operations in the United States have been suspended until better devices are available for implantation, and because there are fears that the silvered electrodes could lead to heavy metal poisoning in the brain. The MRC team will

also be examining the possible long term effects of implanting the electrodes in the cochlea as well as the effects of repeatedly stimulating the auditory nerve with an electrode.

If the technique proves to be workable it is estimated that 20% of deaf people could benefit. But it is far from certain that the research will be successful. Dr Thornton says that "even if I had a patient with a good auditory nerve I would do everything in my power to dissuade him from having one of these operations at the present time". Mr Morgan warns that for people who have been deaf for a long time the technique may create as many problems as it solves. Patients will not just wake up and be able to hear. They will have to get used to interpreting the changed speech patterns that they will hear with the aid of the electrodes.

The institute is also about to start work on a programme of hearing conservation with the help of a £13,000 grant for a three-year period from ICI and Amplivox. Under the leadership of Dr Alan Martin the institute intends to examine why the majority of workers in noisy industries refuse to wear protective clothing.

Dr Martin points out that one company spent £18,000 over eighteen months on hearing protection for its employees, most of it on protective clothing, only to find that only 2% of staff were wearing it.