

SCRAM ENERGY BULLETIN



THE SCOTTISH CAMPAIGN TO RESIST THE ATOMIC MENACE, 2A AINSLIE PLACE, EDINBURGH 3. (031-225 7752)

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TORNESS GATHERING



Preparations for what could be the largest protest yet at Torness are under way. May 4th - 7th 1979 will see thousands of people from all walks of life participating in a mass festive gathering. Many of them will continue the campaign of nonviolent direct action against Torness which was started last November.

Over the weekend of May 6th and 7th last year 4,000 people occupied Torness — the site for Britain's next nuclear power station. It was the biggest demonstration of its kind ever seen. Since then local and national opposition to the South of Scotland Electricity Board's (SSEB) plans to build what could become one of Europe's largest nuclear complexes has escalated dramatically.

Lothian Regional Council have made repeated calls for a public inquiry. An independent opinion poll has confirmed that the majority of people in the Lothian Region are opposed to Torness. Following the SSEB's ruthless eviction of the Torness occupiers and their brutal destruction of Half-Moon Cottage in November, over four hundred people risked their lives in front of the contractor's bulldozers.



More than a hundred local people risked arrest by a mass trespass on to the site. An eloquent plea for the halting of Torness was even made in the House of Commons by Robin Cook, Labour M.P. for Edinburgh Central at a specially arranged debate. All efforts to date however have fallen on deaf ears.

The Scottish Office Minister with responsibility for the Electricity Boards, Mr Gregor MacKenzie M.P., has repeatedly emphasised the Government's determination to go ahead regardless. The SSEB have erected a ten foot fence all around the Torness site and have bulldozed on. It appears

that we haven't yet made our point clearly enough.

TORNESS ALLIANCE

At the close of last May's rally, the Torness Declaration, committing groups and individuals to "all non-violent steps necessary to prevent the construction of a nuclear power station at Torness", was adopted. Out of its signatories the Torness Alliance was formed. The Alliance, based on a decentralised regional network of Britain's many and varied anti-nuclear groups (of which SCRAM is a part) is now preparing the Gathering for May 4th - 7th this year. The

(Cont'd inside back page)



Another fixed Public Inquiry?

Citizens in Saskatchewan, Canada, have been fighting the proposed establishment of a uranium mine and mill in the province for more than two years. Organisations opposing the project include the Saskatchewan Environmental Society, the Catholic Bishops, the United Church, several Indian Associations in the region, and many others.

RUNNING AMOK

It has just been announced that the uranium mine would go ahead despite their concerns. The decision follows one and a half years of public hearings during which hundreds of presentations were made. The uranium is destined for export outside Canada. The company proposing the mining operations is AMOK Ltd., a French corporation. France is not a signatory of the Non-Proliferation Treaty.

The Board of Inquirers for the hearing, deciding in favour of a "planned and measured" development of uranium deposits in Saskatchewan, said in their 1,000-page report that although there are risks in disposing of radioactive wastes, Saskatchewan does not face a direct risk because it has no plans to operate a nuclear reactor for at least 20 years!

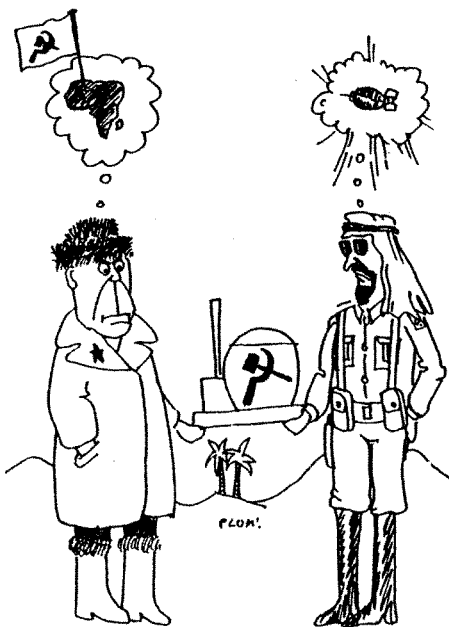
By making this decision they chose to hide under the worn-out excuse that, "if we don't do it, somebody else will". The groups reminded the Government of what Canada's Prime Minister, Pierre Trudeau, had said before the UN Special Session on Disarmament: "...the best way of arresting the dynamics of the nuclear arms race may be a strategy of suffocation, by depriving the arms race of the oxygen (nuclear fuel) on which it feeds."

Contact: the Saskatchewan Coalition Against Nuclear Development, c/o One Sky, 134 Avenue F South, Saskatoon, Canada.

PNS/The Centre Report



News



RUSSIA. LIBYA.

WHO'S NEXT FOR A NUCLEAR BOMB?

The latest in this exciting race is a great deal between Libya and Russia, whereby Russia will supply Libya with a 300 MW nuclear reactor and ancillary facilities to carry out nuclear 'research' and maybe make a little electricity on the side — a reactor of this size (about 1/4 of Torness) is a very expensive source of electricity even by nuclear standards. And has Colonel Gaddafi forgotten about all that oil beneath his patch of Sahara?

So sit back for the next Arab-Israeli war, folks — preferably a long way back, because Israel and Egypt can make nuclear bombs too. Don't worry though, for these are peaceful bombs — they come from civilian nuclear power programmes, so they're obviously going to do nobody any harm.

This year Gaddafi. Next year Idi Amin?

THIS ISSUE

We have always worked to improve both the content and layout of the Energy Bulletin. From the first typed 8 pager in November '77 with a cover price of 10 pence we extended last year to 12 pages keeping the price fixed. By typesetting this issue we have nearly doubled the contents again [with a doubling of our costs].

Accordingly we have increased the cover price and the sub to more nearly match our costs — though we have always been sustained by those generous subscribers who have sent us a fiver instead of the old £1 sub.

This issue has been sent free to many schools, libraries and so on in an attempt to reach a wider audience. We are keen to continue this practice and want to increase our readership in new areas. One or two very generous donations [or lots of smaller ones] would enable us to spread further. We are also considering having maybe one page of small ads in the next issue. Anyone interested, please send us camera ready copy by 9th March.

We remind readers that the Bulletin is open to your contributions, comments and criticisms. Next copy date, 19 March, coincides with our weekly open meetings on Mondays at 7 p.m. to which all are welcome.

C.N.D.



NO ATOMS FOR PEACE

At their last AGM the Campaign for Nuclear Disarmament (CND) resolved to "join the national lobby seeking to halt further development of nuclear energy in this country." Previously the Campaign had promoted an 'Atoms for Peace' line, but the reality of India's nuclear bomb capability among others, brought home the fact that there is little to stop a state with a "civilian" nuclear programme from turning out nuclear weapons.

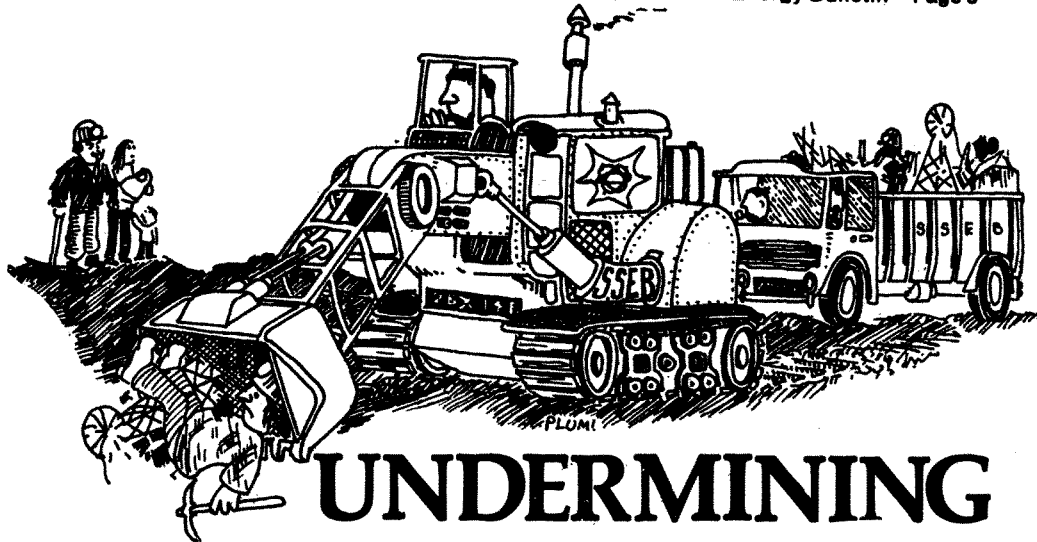
This year CND is organising a long march starting at Easter from Aldermaston. Taking in many of the civilian and military installations on the way, it culminates in a mass demonstration against the UK Polaris submarine base near Glasgow at FASLANE on Saturday 2nd June. Anyone who wishes to join the march or can help organise a public meeting with 'The War Game' film should contact: Duncan Rees, CND, 29 Gt. James Street, London WC1 (01-242-0362),

COAL IN THE SCOTTISH GENERATING MARKET: ECONOMIC AND POLITICAL FACTORS

The present AGR programme is a prime example of where considerations of actual need and economic choice of fuel are overridden by the perceived 'need' to maintain a nuclear plant manufacturing industry, almost irrespective of costs or technical factors.

Coal remains the largest component in the Scottish generating fuel mix, but the policies of the two Scottish Boards - to say nothing of that of the CEGB - have created grave structural difficulties for coal in its most important present market.

In trying to fit a nuclear programme into a context of low or negligible growth in demand for electricity in Scotland, the Electricity Boards are now faced with a massive overcapacity of generating plant. The present position is that the highest ever simultaneous maximum demand (SMD) for electricity in the S.S.E.B. area was in 'excess of 4,400 MW... between 5 and 5.30 p.m. on Saturday 13th January 1979 (1), whilst the S.S.E.B. has a total installed plant capacity of 7572 MW (2). Even this understates the true crisis of overcapacity: Inverkip III will add 660 MW to output capacity this year, making 8,232 MW capacity or approximately 185% of maximum demand. Even allowing the Board's new (larger) planning margin for breakdowns of 30% of SMD, there is a great deal of expensive investment likely to lie idle for many years.



S.M.D. growth has averaged 1.2% p.a. from 1973 to 1979. At this rate, by the time Torness is commissioned in 1988, S.M.D. will be less than 5,000 MW whilst capacity would rise to 9552 MW. Obviously, the Board would hope to see demand rising faster to 'mop up' this overcapacity in the next decade, but strong economic pressures for the closure of older plants look inevitable. This is where coal appears increasingly vulnerable in the Scottish generating market, with coal plant constituting the oldest major stations. Kincardine (760 MW), for example, was first commissioned in 1958.

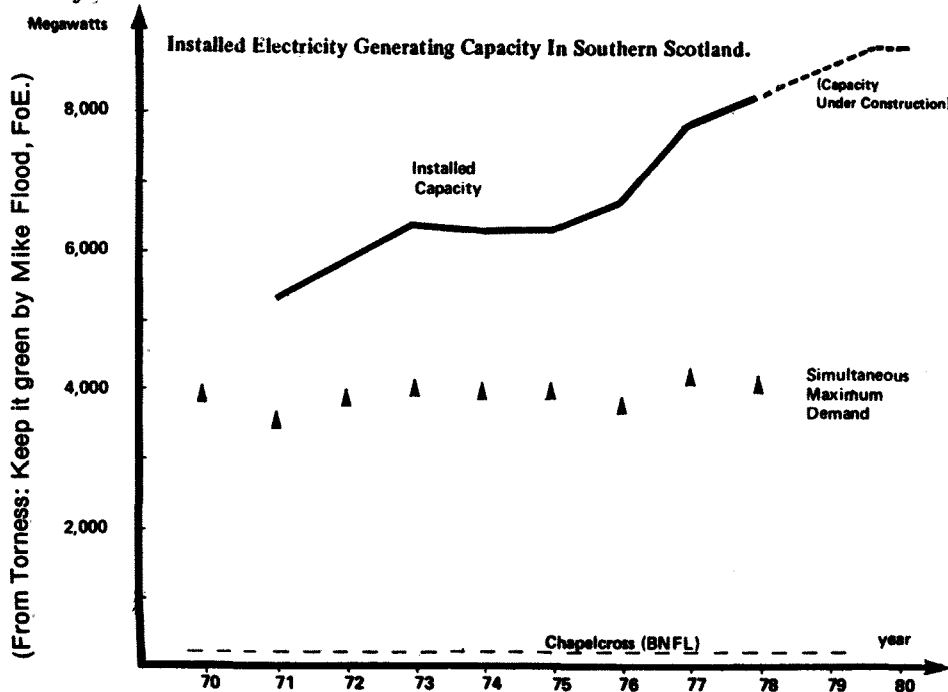
COAL TO GO?

This situation, a direct result of the Electricity Boards evident determination to invest in anything other than coal generation in the 1970's, is paralleled in the U.K. generally, as Derek Ezra pointed out to the Energy Commission in November 1977. Nor is simple closure of coal plant the only problem: the operating regime even where the plants remain in being must also be considered. Older

and therefore less thermally efficient plants will be lower on the Board's 'merit order' and they will only be used when available stations with a cheaper marginal unit cost are fully loaded. If coal stations are retained, but 'cut in' only on peak load, they will obviously contribute less to coal burn, so weakening coal's market and leading to increased demand for substitute nuclear base-load generation. The S.S.E.B. have stated in a recent paper to the Kincardine workers that they intend using Kincardine simply as a peak load station in future, and even so the Station's annual load factor will be quite low up to the mid 1980's.

As if all this was not a difficult enough situation for coal-fired generation, there is also the further complication of 'fitting in' usage of the North Board's brand new white elephant, at Boddam, near Peterhead: a 1320 MW oil/gas convertible station due to come on stream this year. Boddam will burn ethane, a component of the rich natural gases associated with the Brent Oil Field, and which would otherwise have to be reinjected during production or flared. Officially, ethane will be burnt for a 'temporary' period of three years, but unless the ethane 'cracker' is built at Mossmorran (which I, for one, doubt will happen) this fuel will be available for about seventeen years as a by-product of Brent Oil production, and will be used for generating electricity.

The significance of Boddam is that it alone can supply no less than $\frac{3}{4}$ of the North Board's demand at SMD, and with the existing 1,052 MW of conventional (cheap) hydro-electric plant and 700 MW of pump storage the North Board will have itself a considerable and embarrassing overcapacity. Up till now, the South Board has been able to sell electricity from



its 'spare' plant to the North. Boddam will seriously affect this market, and in particular bring lower load factors on older (particularly coal) plant in the South. Recent indications are that the SSEB expects a 'short term problem' in maintaining its present eight million tons p.a. coalburn 'if gas is burned temporarily at Peterhead'. They aim to 'support the N.C.B. in pressing for a special arrangement to enable the balance of coal to be sold elsewhere during this period'. This presumably means driving the coal industry into yet more dependence on fixed term and politically vulnerable subsidies, like the 1977 Coal Industry Act, rather than taking effective action to remedy the structural problems of a weak market for coal.

If, as appears probable, ethane is burned for a longer term at Boddam, the displacement of coal sales for generation will pose a severe problem for the N.C.B. and coal industry suppliers. In short the main factors in the present Scottish generating market for coal are these:

1. The reliance on Electricity generation for approximately 70% of coal sales.
2. The considerable and growing overcapacity of plant in North and South Board areas.
3. The present restructuring of fuel mix for generation with modern oil/gas and nuclear plant competing with older coal plant in merit order.
4. Instability in fuel costs, with gas and even oil (with a weak Dollar) displacing coal burnt in the less efficient stations - increasing coal's reliance on subsidies.
5. The technical and economic necessity to use nuclear plant for continuous generation (where it actually works - i.e. not Reactor 4 at Hunterston) to offset the much greater capital costs of nuclear plant and the de-rating of the A.G.R.'s.

With present plant and policies, the load factors for coal stations will be likely to decrease. Even the peak-load function of coal stations must in the longer term be adversely affected, especially if the North Board are allowed to build Europe's biggest Pumped Storage scheme (Craigroyston 3,200 MW) on Ben Lomond, as they intend.

CAPITAL COSTS

Ironically, the enormous capital costs of the present nuclear/pumped storage building strategy of the Scottish Boards will themselves be a major factor in keeping electricity demand down by putting up electricity

costs to consumers. Torness A is currently estimated to cost £742M. at '78 prices (3), Craigroyston has been quoted at £220M. since 1976. However, the estimated cost of Craigroyston's proto-type at Dinorwic in North Wales, at 1800 MW, just over half its capacity, has now escalated to £410M. at '78 prices.

Quite apart from the potential dislocation of coal markets by the Scottish Boards' investment strategy, there must be serious doubts as to its economic viability in view of these enormous capital costs.

Energy Commission Paper 6 on Coal and Nuclear Power Station Costs (4) shows that nuclear plant economics are affected to a significantly greater extent by construction delays, and plant performance ('outage' and 'derating') shortfalls. On all three of these counts, A.G.R.'s have a poor track record. The saga of Hunterston B's delay, derating and Reactor 4 shutdown has been told elsewhere (5), but what is perhaps less well known is that Torness A is to be modelled on the wretched thing. A 'Progress Report' on Torness states that it is of 'overriding importance that the new A.G.R. should follow the Hunterston/Hinkley designs as closely as possible' (6) - rather unfortunate precedents, both of them.

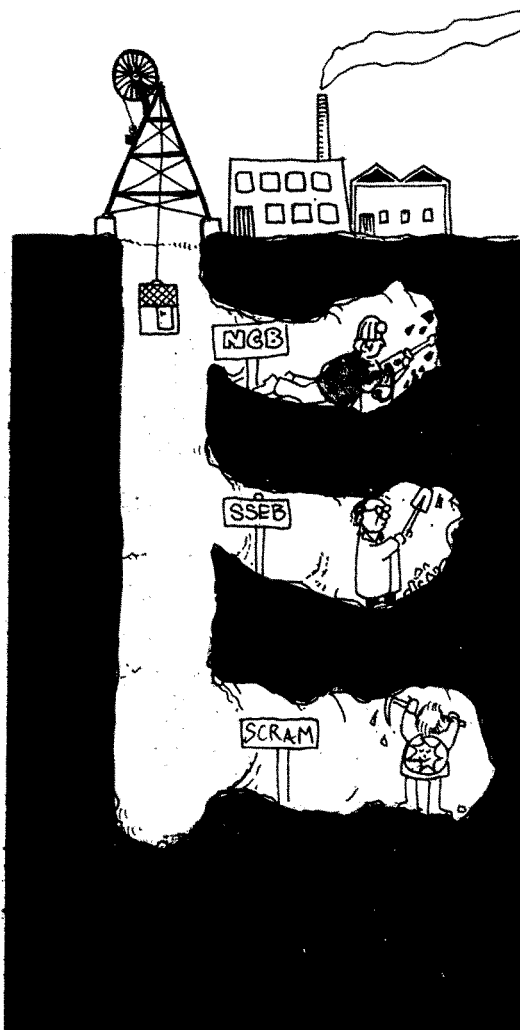
In contrast, the economics of investment in coal fired generation depend heavily on the relative future price movements of coal and other fuels. This in turn depends on political as much as economic factors: the price of oil, U.K. decisions on the extent of investment in new coal mines and extractive techniques, and the bargaining strength of the miners being among the most important.

It is clear, though, that a plant ordering programme based in part or entirely on coal-fired generation, would have considerably lower capital costs than the present programme. This, of course, begs the question of whether we need now to order any additional plant to cater for an entirely conjectural load growth (the answer to which is clearly - no) or simply replacement plant to obtain the advantage of technical improvements and higher thermal efficiency of modern equipment.

The capital costs of coal as compared to A.G.R. stations of identical capacity are approximately in the ratio 1:2. Energy Commission Paper 6 estimates construction costs per K.W. at £290 for coal and £470 for A.G.R.'s. This excludes the initial fuel charge of the A.G.R., but most importantly, it is based on an estimate of 'settled-down costs' in later series ordering, rather than actual experience, in the case of A.G.R.'s.

Further, construction cost escalation has been greater for A.G.R.'s, (7) and this has been significantly exacerbated by their derating from design capacities (8).

The unsuitability of nuclear plant for 'power cycling' means that when, as now, generating fuel mix is becoming more weighted towards nuclear as against other fuels, some way of balancing increasingly inflexible supply with fluctuating demand must be built into the system. Pumped Storage has that function, and under present circumstances must be regarded as an integral part of the costs of a 'nuclear' programme. The magnitude of the projected Craigroyston scheme, increasing Scotland's Pumped Storage capacity from 700 MW to a total of 2300 MW in its first phase alone, is itself a measure of the Scottish Boards' nuclear ambitions. A building programme weighted more towards coal, conversely, would reduce the need for pumped storage capacity, depending on precise plant mix and load factors. The costly and environmentally damaging Craigroyston scheme, phase II of which the North Board admits publicly may never be needed even under present policies, could be shelved in favour of less grandiose and intrusive development.



KINCARDINE

At the first meeting of the Energy Commission, Gregor McKenzie said that what he feared in Scotland was a conflict between the coal and nuclear interests. The present Kincardine debate is in part a focus for those interests, though the official line is still that no conflict need exist between them - 'we shall in practice need maximum use of both (coal and nuclear)' (9)

This is also, for the moment at least, the view of the coal industry and the miners. But the evident structural weakening of the market for coal already discussed is giving them increased grounds for concern. As the oldest major coal station in Scotland, Kincardine will be the first to be scrapped, and the alliance of power workers and miners' representatives on the Campaign Committee have been working towards two objectives: to keep the station open as long as possible (primarily for direct employment and the local economy) and to ensure that it is used (to maintain the market for Scottish coal, and to bring about N.C.B. investment in a new mining complex to 'belt feed' the station from the Hirst seam).

Representatives of the Campaign Committee, with the three local M.P.'s met Gregor McKenzie, as the responsible Scottish Office Minister, on 15th December last to discuss a previously submitted statement (10) of the case for re-equipping or replacing the station. From that meeting, and a subsequent S.S.E.B. paper to the Kincardine Unions (11), the following points emerged:

1. An additional temporary subsidy of 1.5M. was to be made available to the N.C.B. to supply cheaper coal to Kincardine over the winter. The station has operated fairly continuously on this from December, but will probably shut down again by February.
2. Decommissioning of Kincardine has been pushed back to the mid-1990's by a programme of plant renovation extending to 1985. However, the load factor will be low until the mid '80's, when 'the demand for electricity is expected to rise'!
3. The S.S.E.B. is unwilling, for a variety of reasons, to rebuild the station on the same site, installing large modern units, or otherwise increase its generating capacity (12). However, repeated assurances have been given that the Board is actively considering planning a new coal station in the Forth basin.

The Kincardine Committee is considering these and other related developments, and it is likely that there will be pressure to maintain or increase load factors to sustain coal-burn, especially in view of the impact of Boddam. The changing economics of coal as against nuclear generation may well make the S.S.E.B. more favourably disposed to investment in and the use of coal, but the underlying problems remain.

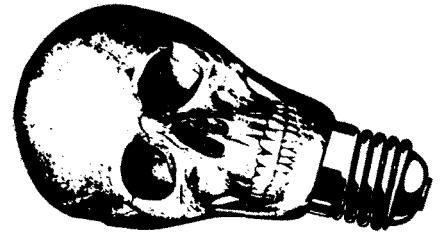
In the longer term, the objective must be to secure investment in modern, efficient coal-fired plant, which will ensure coal's market position without the present excessive reliance on (politically vulnerable) subsidies. New techniques of coal extraction and firing are being developed, though until recently the coal R. and D. programme was only receiving about 10% of the Nuclear R and D funding. The £50M. programme for the development of fluidised bed combustion announced in May 1978 is itself indicative of the increasing Government caution on the nuclear options, evident in the 1978 Green Paper (13).

In Scotland, the expertise of Babcock and Willcox in fluidised bed combustion technology could be developed, with Combined Heat & Power (CHP) and other technical advances, as part of an integrated, employment creating, reliable and less extravagant generating system. Though that might appear far off at present, economic and political factors are increasingly pointing in that direction.

Douglas Wynn

References:

1. Scotsman 15th January 1979
2. S.S.E.B. Annual Report for 1977-78, p.8.
3. Note: Costs for Hinkley B AGR escalated by 30% at constant prices.
4. Department of Energy, January 1978.
5. See SCRAM Energy Bulletin No. 7.
6. Torness Power Station - Progress Report (S.S.E.B. September 1978).
7. See note 3.
8. 18% in the case of Hunterston B (1320 MW-1084).
9. Energy Commission Paper 6, para. 31. 'The clear prospect of an energy gap means that the maximum use of both coal and nuclear stations will be required in due course' Gregor McKenzie in Torness Adjournment Debate, Hansard 4/12/78.
10. 'The Refurbishment of Kincardine Coal-Fired Power Station' 30.10.78 (Available from the author, C/O Sociology Dept., Stirling University. Large s.a.e. please).
11. 'Notes on the Board's Proposals to Refurbish the Kincardine Plant', December 1978.
12. But see Report on Carriden Inquiry, May 1974. Para. 2.35.
13. 'Energy Policy: A Consultative Document' Department of Energy, February 1978.



NUCLEAR POWER & LEUKAEMIA

A group of German scientists recently discovered that the rate of child mortality near nuclear power stations is significantly higher than in the rest of the country. A study was carried out in the area of the nuclear power station at LINGEN near the Dutch border. The simple result was that since the reactor in Lingen started up, the rate of cancer among children rose drastically (cf. Hamburger Morgenpost, 25 October 1978). Whereas until 1968 only 30 cases of Leukaemia were recorded the scientists of the Bremen based Institute for Biological Safety found 200 cases after 1978. More than ¾ of the victims were children under 15 years of age. This means that the incidence of leukaemia near Lingen (in a 50 mile radius) is 12 times higher than in the rest of the Fed. Republic.

The scientists admit that their study was necessarily incomplete and inexact since there are no official statistics regarding cancer. In addition to this the scientists could not extend their study to the Netherlands. However, these deficiencies are not only the result of the state's practice of hiding dangerous facts. Where (as in Hamburg) statistics about cancer are kept, they are considered 'top-secret', inaccessible to the researchers. This makes it increasingly difficult to state real correlations between the death toll, cancer in a certain area, and causes, such as nuclear power stations. But as long as the facts are hidden it is even more important to demand the shut down of ALL nuclear power stations.

Of course the reaction of the pro-nuclear lobby was obvious; they maintained that the study was another smear campaign against nuclear power: for these people with their cynicism a death toll of 200 in an area with one million inhabitants was only an insignificant figure, too small to be taken into account.

The reaction of the Press was typical. At first the entire press printed the worries of the researchers and the people concerned. But only a few days later they went in the opposite direction: a campaign against the researchers, one of whom 'does not even pay his rent'! The scientists became people who try 'to make money with the widespread fear of nuclear power'.

The German Government has now ordered an 'independent' investigation (in support of the German nuclear programme).

Wolfgang



HIGH TECHNOLOGY

There's a general principle of science known as Occam's Razor. In one version it goes as follows: "If you are faced with a problem which has a number of possible solutions, then you would be well advised to try the simplest ones first."

The Energy Problem can be easily stated:- our industry is driven by non-renewable fuels which will, sooner or later, become scarce and expensive — but what of the solutions?

According to an article in the Observer Colour Supplement (21st January 1979):

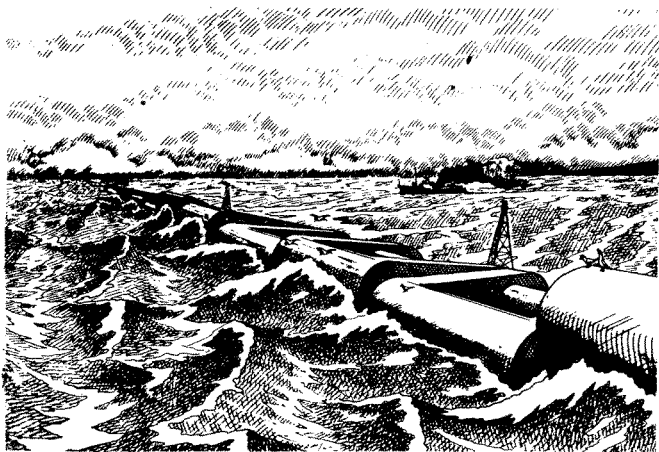
"There is widespread dislike of nuclear power stations, and in any case it is unlikely that they can come to the rescue in time. Fusion power, the clean energy source on which considerable research is now being expended, will not be available until well into the next century, if then. That leaves solar power satellites."

Solar power satellites? Yes — all an energy starved nation need do, it appears, is find a super-power willing to launch 50,000 tons of aluminium, titanium and iron into space; deftly mould it into a 5,000 megawatt solar power station and beam the resultant energy, via microwaves, to a receiving station on earth.

The author readily admits that there are technical problems to be overcome: like the fact that present space shuttles carry a payload nearer to 30 tons than 50,000; such as the difficulties of keeping a giant 7 mile long satellite in space without it falling out of the sky, without the beam straying from target and frizzling passers-by and without it becoming a sitting target for anti-satellite missiles.

But, says the article cheerfully, "eight of the larger (5,000 megawatt) stations would be sufficient to provide the entire current electricity needs of the UK" and adds that NASA and British Aerospace are sufficiently enamoured with the idea to be carrying out design studies.

Where are you Occam now that we need you?

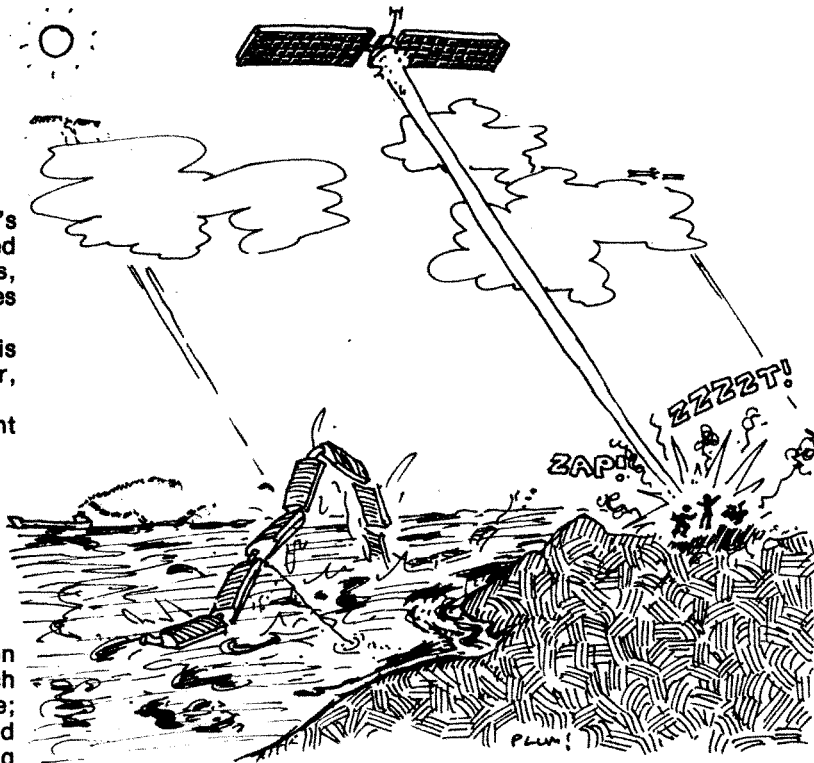


WAVE POWER - THE ANSWER?

If that were an isolated incident then it might, perhaps, be passed over as the idle musings of a generation of scientists reared on Arthur C. Clarke and Dan Dare. Consider, though, the front runner in the British Alternative Energy Stakes (leaving aside expensive dreams of fusion power, whose only release of energy to date has been in the H-bomb) — wave power — backed by £5½ million of government money.

At first sight it seems a promising source of renewable energy, and ingenious devices for harnessing the power of waves, from nodding concrete 'ducks' to oscillating water columns are under development; but already the research is beginning to founder.

The first, and major, problem is that it's not possible to be half-hearted about wave power. The huge energetic wave swells are to be found far out to sea and are not concentrated in one area, but spread over the surface of the ocean. Thus the wave power units have to be correspondingly large to



trap them: one current design consists of a line of concrete wave generators up to 10 miles long.

Then there's the task of bringing the energy ashore. Electricity? Floating generators and high voltage cables will come expensive, especially if the devices are moored many miles offshore. Hydraulics? There will doubtless be a few problems with handling megawatts of hydraulic power. Ironically the nuclear industry was quick to recognise the problems of power transmission and helpfully suggested (in C.E.G.B. Research May 1975) that the power could be used out at sea to drive plants which would separate uranium from sea water. The uranium could then be used to fuel nuclear reactors!

Lastly there is vulnerability. Wave power engineers talk of the "50 year wave" — an abnormally large swell, perhaps 50 times more powerful than the average wave, which could batter a small unit to pieces. Such a wave would be extremely infrequent but any generator must be built, with considerable extra bulk, strength and safety devices, to withstand this once in a lifetime occurrence.

Large capital cost; huge inaccessible devices; a vulnerable power transmission system; troublesome to maintain and open to sabotage — what does this remind you of? Yes, of course, solar satellites.

OK, let's try applying Occam's Razor: are there simpler ways of managing energy in the future?



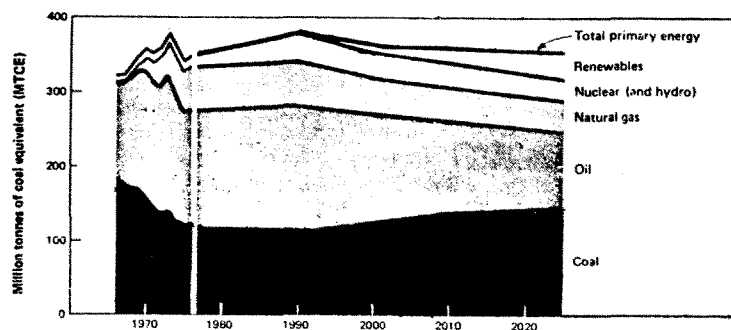
The IIED Report

A LOW ENERGY STRATEGY FOR U.K.

The most obvious way is to not use it in the first place.

Energy conservation, long regarded as a stop gap measure, a means of staving off the impending doom for a couple of years is, at long last, being taken seriously.

From a detailed survey of over 400 categories of energy use, the International Institute for Environment and Development (ref 1) concludes that simple energy conservation measures could reduce Britain's primary energy use by up to 25% over the next 50 years — and this accompanied by a steadily rising standard of living.

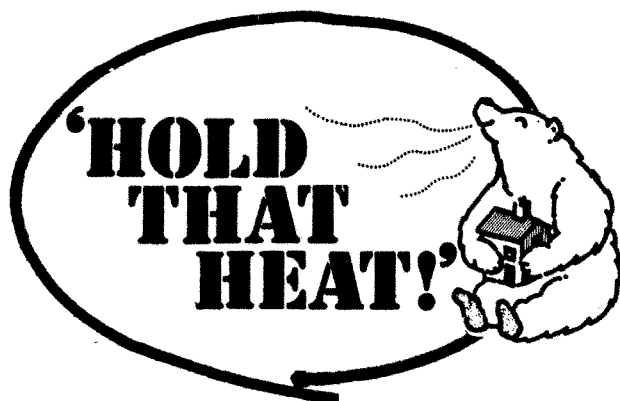


Primary energy projections, High case

"For energy savings our assumptions merely involve the introduction at fairly moderate rates of technologies that are already widely used or, in a few cases, are expected from a canvassing of expert opinion to be available by the mid-1980's. All of them are either cost effective now or are being developed because people expect them to be cost effective" (ref 2)

The report assumes there will be no use of alternative energy until the year 2000 and no new nuclear stations.

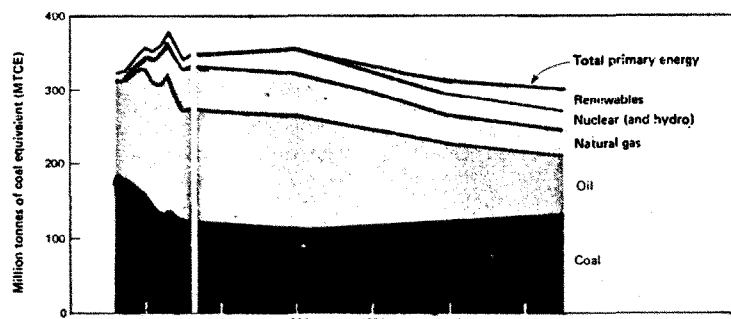
There appears to be just one catch in this strategy — it would require the Government to make a positive effort to encourage energy conservation.



"In particular we have assumed that government sets energy consumption targets for new buildings of all kinds, for cars and light vans, and for cookers and major electrical white goods. In all these important categories energy savings of about 50% are technically possible — and with the possible exception of road vehicles — at very low cost."

These proposals are hardly outlandish — over the last century Britain has taken a giant leap backward in energy conservation: among the best insulated houses in Britain are the centuries old stone crofts, and without doubt the worst insulated are modern high-rise flats.

A serious conservation programme would undoubtedly muffle the bells of doom which energy forecasters have been sounding for the last decade — but it would only slow down the wastage of fossil fuels; eventually we will need alternatives.



Primary energy projections, Low case

(Graphs from IIED Report p.17)

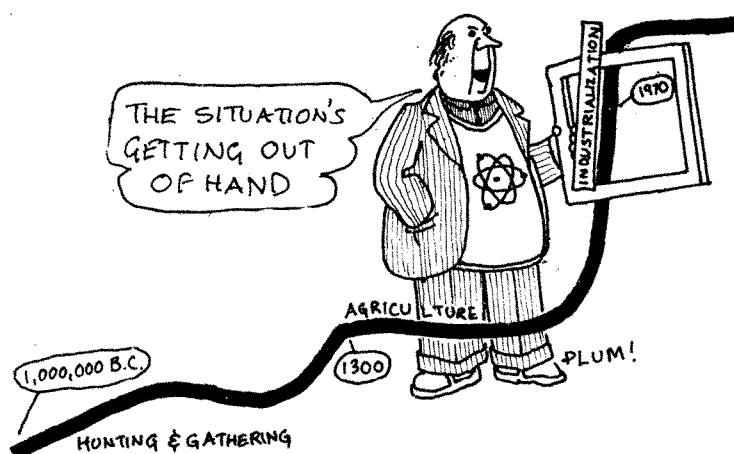
APPROPRIATE ENERGY

Right, let's try the simple approach again. We know that "high technology" capital intensive energy sources are a bad bet in the immediate future because they generally require many years research and development and a huge expenditure before the first full scale prototype can be tested; a small number of large power stations, especially sited far from potential users, are equally unwise — because of the power losses, cost and downright ugliness of power lines.

So, that suggests small inexpensive local and domestic power generators, to supply the energy where and when it's needed; which is quite fortunate, since such technology is not only practicable but has been around for a considerable time.

Heat pumps — which work like refrigerators in reverse, forcing heat into a room: solar water and air heaters; biomass convertors — which burn up natural waste — and windmills have all been used to provide power for a century or more.

So why are they not being developed further and used in every home and factory? Why did the average taxpayer in 1977-78 contribute £5.32 to nuclear power development, but only 12p to developing renewable sources of energy? (ref 3).



HOW DO WE CHANGE 'EM?

There is no simple answer — Britain's present energy strategy would appear to be partly governed by the technologist's love of complex, expensive solutions to simple problems, and partly by the political muscle of the nuclear industry and the giant engineering corporations such as G.E.C., and Taylor Woodrow.

These were described by the Energy Secretary in 1977 as the most powerful lobbying forces he had faced in his entire political career, and they are not renowned for their support of small cheap power sources.

There are signs though that the government is altering its strategy and the recent report on conservation by the IIED must surely hasten that change.

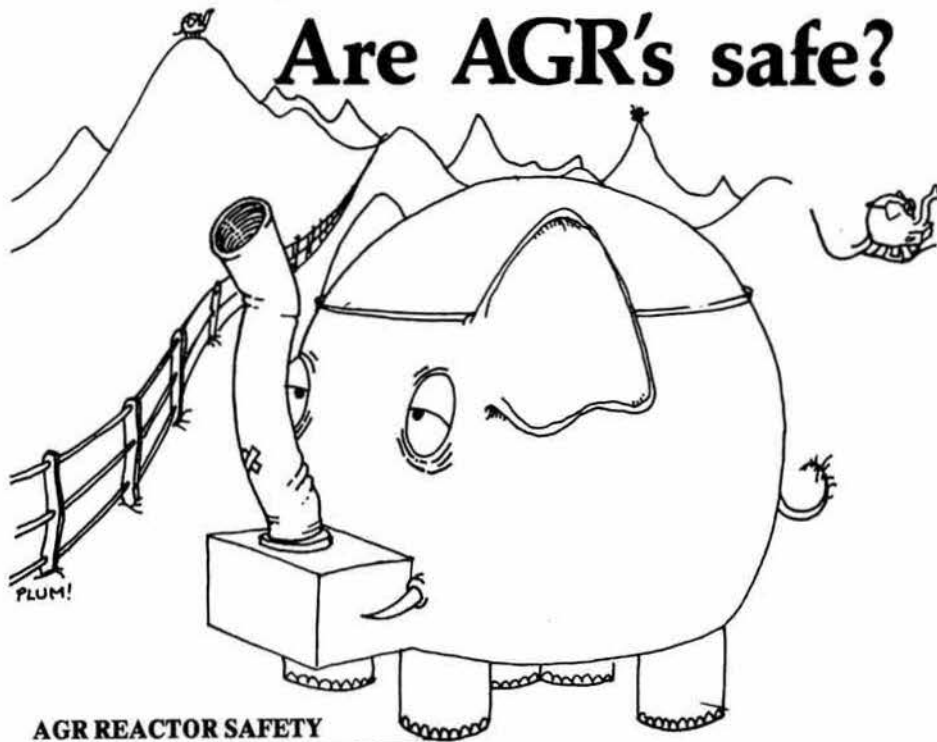
As for the opponents of nuclear power, we need no longer be forced into a corner, willing to grasp at any alternative to nuclear energy. Gerald Leach and his colleagues at the IIED have shown that we can afford to be choosy about future energy supplies. That does not constitute a plea to abandon research into wave power — or solar satellites for that matter — for we need to open up the energy options rather than restrict them, but rather it is a call to government to give the technology of renewable energy time to gestate by carrying out a serious and comprehensive insulation and conservation programme. Every house, office and factory built from now onwards must be a symbol of government's determination to save rather than squander energy. As a first step the name "William of Occam" could be inscribed on every government scientist's desk.

Mike Sharples

References

1. A Low Energy Strategy for the United Kingdom, published by Science Reviews and IIED, 10 Percy Street, London W1P 0DR. (£8 inc. p. & p.)
2. New Scientist, 11th January 1979, p81-83.
3. ATOM Oct. '78, p283.

Are AGR's safe?



AGR REACTOR SAFETY ASSESSMENT AND THE POLITICS OF ACCEPTABILITY

When called to give evidence at the Windscale Inquiry all witnesses were asked to take an oath, 'to tell the truth, the whole truth, and nothing but the truth'. As a scientist I felt uneasy, but faced with Mr Justice Parker's conception of truth, I saw no way out but to affirm, and get my evidence considered. Much later, Brian Wynne, who felt the same unease, voiced an appropriate response: 'you can expect a scientist to tell the truth, and nothing but the truth, but not the whole truth'. He had made a strong plea at the Inquiry for pluralism in all safety research, that is, that independent University groups, and critical environmental groups, be given access to information and to decision makers (and perhaps funds) so that they may conduct critical assessments and check official pronouncements. It was felt then, by Wynne and ourselves, that the protecting bodies were probably doing an admirable job, but that had to be seen to be the case if nuclear power was to become accepted democratically.

Our researches over the last year of PERG's work have unfortunately not given rise to confidence that the authorising bodies are carrying out their task as one might wish. In particular we have become concerned about the question of AGR safety since the incident at Hinckley Point, when the newly commissioned reactor lost both primary and secondary cooling following a 'double-fault'. Such events are supposed to be designed out of a system, or made so unlikely as to happen 'once in a million years'. Our interest developed when Dr Franklin of the Nuclear Power Company looked visibly embarrassed when asked what the calculated probability

of the Hinckley failure had been (1). He did not give a figure, but assured us there was no danger to the public, that the cooling had been restored quickly with the use of fire hoses, as designed for in emergencies. We became suspicious when this did not accord with an answer received from the Secretary of State (2): the AGR had lost both primary and secondary cooling due to a pipe-break and simultaneous failure of a sea-water valve which flooded the pump house. Fire hose connections were not present on that reactor model and it took 3 hours to fix up emergency cooling from the external supply. He stated there was no danger of a radioactive release during this time period.

It has taken us some time to track down relevant data for this event. As we shall indicate later, the situation with regard to AGR information is unique — virtually none has been produced for public consumption. However, there was a time when nuclear power was not so controversial and the proceedings of symposia in the late 1960's can be a fruitful ground, for then the nuclear safety experts could openly voice their doubts or criticisms.

We can take one example relevant to Hinckley Pt and to the general problem of AGR safety:

- generally speaking the reactors are designed to be safe in the event of any **single fault** developing. If one circuit is out of action due to a pipe break or valve failure, then another back-up system is present. A **double fault** that could lead to a hazard must have a design probability of between 1 in 10,000 to 1 in 1 million reactor years depending on the severity of the consequences.
- this philosophy was developed by Farmer of the UKAEA (3), and is known as 'design under risk' or 'probability analysis'. It has its limitations, but for design engineers it does provide a **target** for the safety of their designs.
- at the outset, Farmer expressed caution: 'on whether the probabilities are achievable in practice: 'an open question, there is too much credit taken for 300 reactor years of safety' and 'a failing to see or adequately to have regard to all those minor and sometimes major feature of equipment or of organisation which might nearly have led to disaster'.

The Royal Commission on Nuclear Power and the Environment considered the Farmer approach as valuable, but limited: in that not all failure modes could be foreseen (and ascribed a probability) and that the probabilities that were ascribed were essentially design objectives—whether they would be met in practice would depend on the quality of workmanship, maintenance, and human reliability.

Anyone who reads the speeches of Sir John Hill, or the letters to the Times from the Engineering Institutions of Britain will be hard pressed to find any such reservations. The 'target' probabilities are taken as established fact on the basis of several hundred reactor-years of safety.

Hinckley Pt's loss of cooling was a double fault, Hunterston's flooded core we know less about, but clearly, they were not supposed to happen quite so soon. What were the ascribed probabilities for these events? If we could know that, we would have some idea of how the builders and designers and maintainers were meeting their targets.



A literature search of proceedings of symposia brought forth this answer for Hinckley Point: Cave and Holmes (4) placed the probability of this event at once in 100,000 reactor lifetimes (30 yrs) and stated: 'the AGR is a good deal safer than the PWR in this loss of coolant situation due to the heat capacity of the moderator and the boilers....there is a period of 3-4 hours available in which to restore core flow and boiler feed flow and thus to prevent the melting of any cans of fuel'.

Thus in its first year Hinckley Point experienced a one in a million 'incident'. Cooling was restored by firemen and a hose — into the fractured pipe, there being no emergency fittings on that model AGR, and within one hour or less of the core melting — the worst accident to a reactor. The official report of this 'incident' is not yet available. We can accept no assurances until such time as information is available for independent and critical assessment.

What could happen at Torness (or Hunterston, Dounreay, etc.) if a core melt-down occurred? This depends upon whether the reactor containment is breached and in what manner. No detailed accident studies have been provided for public consumption (in contrast to the US LWR). We can, however, turn to the Royal Commission. They considered such a 'melt-down' could lead to up to 10,000 casualties and many square miles of contaminated and uninhabitable land. The casualties would be divided between several hundred immediate radiation deaths and the rest long-term cancers of the lung or bone. A detailed consequence study of the FBR carried out by the NRPB at the instigation of Tony Benn gave a similar figure of 60,000 deaths (5).

To underly what we have learnt of official reports: when we came to repeat the computer runs that these

figures were derived from, we found that a certain category of not uncommon weather had been omitted—under these conditions casualty figures were ten times worse—thus an AGR melt-down in a semi-urban situation could lead to 100,000 deaths. This would apply to Torness if the wind blew the radioactive cloud toward Edinburgh—PERG would be able to model such a release more specifically if it had the resources.

We are led to the following conclusions:

- the safety of the AGR depends upon human judgement and reliability throughout design, construction and maintenance,
- in these respects we regard the AGR as unproven as the Magnox record is not a reliable guide, the human factor is now very different:
 - a) because of the present economic situation, designs are scaled up, corners cut, labour relations are bad, confidence is low,
 - b) because of the political situation there is an obsessive secrecy and protective loyalty within the nuclear industry, thus criticism, the greatest safeguard of all, is silenced.

The first few years of AGR operation bear out this thesis, and we know many scientists within the industry agree but cannot talk. We call for the greatest pressure for an open safety assessment as has been carried out for the Light Water Reactor.

Peter Taylor, PERG

- (1) Oxford meeting of Nuclear Discussion Group
- (2) Parliamentary Answer 2 Feb. 1978
- (3) Proc Symp IAEA Jülich, Vienna 1973
- (4) Proc Symp IAEA Sm 89/32 Vienna 1967
- (5) NRPB R-S3, Kelly et al, consequences of national accident to an FBR.

Further Reading:

OR4 - The Windscale Enquiry and Safety Assessment.

OR5 - A Potential FBR Accident at Kalkar.

50p each (inc p & p) from PERG, PO BOX 14, OXFORD. Send s.a.e. for full list.

SCRAM Film

You've read the newsletter, been on the demo, signed the petition — now see the film! SCRAM's own film of the Scottish anti-nuclear movement made for the BBC Open Door series.

It details the threat to Scotland of the nuclear fuel cycle — from proposed Uranium mining in the Orkneys, to the Torness reactor, to waste dumping in the Galloway Hills — through the words of determined local activists.

Colour 30 mins. £10

From: Mike Sharples, SCRAM Films, 22 Panmure Place, Edinburgh 3. (031-667 1011, ext. 2463 day, 228 1386 night

TOO STRICT?

A Radio Free Europe report of an international seminar held in Czechoslovakia in November '78 on the Safety of Nuclear Power Stations, notes that "even a cursory glance at the literature about the use of nuclear energy reveals that Eastern and Western attitudes and approaches to the problem of safety in industrial nuclear installations are diametrically opposed. The interminable discussions in Western Europe, with their prevalently antinuclear bias, are summarily dismissed by Czechoslovak and Soviet scientists. The safety rules for nuclear power stations in the West are "too strict", Soviet representative Gvishiani reportedly argued. Such rules, he claimed, were "often psychologically determined" and only served to "raise construction costs" without providing additional safety." ?!

Chequered History

Charter-77, the Czechoslovak human rights movement, last year entered the nuclear debate, with an exposé of conditions at the Jaslovské Bohunice power station. According to Document 22 of the Charter movement (distributed abroad by the Palach press), employees at the power station have been compelled (under threat of loss of premium payments) to expose themselves to radiation levels considerably above the safety standards, while, in the course of the last three years, two serious accidents, one of them causing the death of two workers, have taken place at the station. Indeed, claim the Chartists, since the second accident in February, 1977, the station is still "Temporarily" closed. The station is a 110 MW gas-cooled heavy-water reactor of Russian design.

LOCKED DOOR

On 5 January 1976, an error occurred in the re-fueling process. A fuel element shot out of the reactor, under a pressure of 60 atmospheres together with a large quantity of radioactive CO₂. Since the emergency gas-traps and filters were insufficient for an accident of this magnitude, radioactive gas escaped into the atmosphere. In the area of the accident, emergency evacuation plans went into operation; unfortunately, one escape door had been locked, apparently to reduce petty thefts, and two workers were suffocated.

Some six weeks later, however, disaster struck again (according to the Chartists). During the mounting of new fuel cells, the primary circuit overheated, the air-tight seal of the steam generator ruptured, and, as a result, the primary circuit, part of the secondary circuit and the working area all became contaminated. Radioactive material entered the drainage system of the plant and a stream in the vicinity has since had to be "fenced off" as contaminated.

During the repair work to the reactor, says the Chartists' document, safety levels of radiation were increasingly ignored, in an attempt to expedite the work.

The authors of the document urge nothing less than an open discussion and local referenda as to whether nuclear power stations should be constructed at all. Current plans envisage a nuclear expansion of 10,280 MW over the next 15 years, so that by 1990 over 30% of the installed generating capacity would be nuclear.

With such a major commitment to nuclear energy, the reaction of the Czechoslovak authorities to the report is predictably to deny everything. No such accidents occurred, they say, and even if they had occurred, they were under no obligation to make any public announcement.

Nature

GERMAN MIRACLE?

DECOMMISSIONING IN W. GERMANY

Federal Chancellor Albrecht from Lower Saxony recently announced "the biggest experiment in the history of nuclear power stations" - a full-sized reactor is soon to be decommissioned in Bavaria. The Niederaichbach reactor had been shut off in 1974 after running for only 13 (thirteen!!) days. The construction costs were 600 million marks (about £150 million).

At the time the reactor was shut off the German magazine "Der Spiegel" reported that nuclear reactors cannot be dismantled, since there is no experience of how the core can be rendered innocuous. Only a few research reactors have been dismantled, but such 'demonstration power stations' as the Niederaichbach one stand as contaminated ruins on the test site. Ordinary decommissioning as for oil and coal fired power stations is impossible. Even when the last uranium fuel has been burnt up the atomic fire keeps on burning in the reactor core behind the several feet thick concrete protective walls, the report said.

PROBLEMS

But we are used to miracles performed by the nuclear lobby. NOW it is possible! Although, as Minister Albrecht's statement suggests there are still a vast number of unsolved problems:-

- the completely contaminated inner parts of the reactor (e.g. the pressure chamber, the steam generator) and even the protection walls cannot be dismantled directly, as the amount of radiation the worker would be subjected to would be deadly. This has to be done by remote control.

A special plasma arc cutting method is to be used. During this process radioactive gasses develop. Nobody knows where these will go and what to do with them.

Finally, when the thick outer walls are being broken up vast amounts of radioactivity are set free into the environment.

A conference of the German "Atomforum" in 1978 stated that the most radioactive parts of a reactor will emit radioactivity for a period of 1.2 million years, others 150-2300 years.

"The biggest problem is the storage of the material. Up to now we only know that it has to be stored underground. In order not to disturb people and stir up new protests Herr Vogl of the Bavarian Department of Environment avoids hints of where the debris of Niederaichbach might be dumped."



MEDIA CON

Meanwhile a big press campaign has begun to try to convince the public that despite all these problems decommissioning is safe:

"With these new techniques (which new techniques? - there are only vague mentions of cutting, welding and sawing) the people in charge in Munich and Bonn feel relieved...New technologies and welding techniques seem to be making decommissioning possible".

"As the reactor has only been used for an extremely short time a safe dismantling won't be so difficult as it would be with a reactor that has been run at full capacity for a number of years."

In July 1978 the Bavarian Ministry for the Environment released a statement that all new welding techniques were only in the process of being developed and that at that time permission for decommissioning had not been asked for. Now, only three months later permission has been granted! Quick work eh? There seems to be good reason for haste. First, this project has to serve its function in the environmental campaigns of the three major parties.

"The Bavarian Ministry for the Environment hopes to contribute positively to the discussions about the dangers of nuclear power by supporting the decommissioning project. They believe that the safe decommissioning of a nuclear power plant might make people trust and believe in the safety of this kind of energy."

GOLDEN AGE?

However, the main point seems to be that the government and the nuclear lobby have themselves lost confidence in the nuclear programme. A spokesman for the Ministry:

"Anyway we have to take into account that in the foreseeable future ALL reactors will have to be decommissioned".

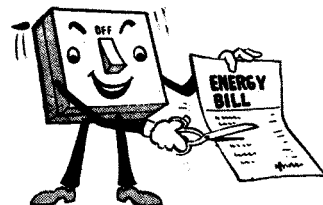
He's quite right. According to a report issued by an EEC Commission in Brussels, there will be a hundred nuclear power stations due to shut down during the next 30 years.

Finally, what about the costs of decommissioning? The costs will certainly reach several million. A part of that will be paid by the State. That certainly means good profits for the decommissioning companies. We are entering the golden age of dismantling.

Wolfgang

(Quotes are from the German Press)

Consumer Campaign



Demonstrating, picketing, leafletting and giving information on the costs of nuclear power to consumers near electricity showrooms is an effective way of making contact with people (who might not otherwise be seen dead on a site demo) and helping them with their energy problems. A brief demonstration with simple leaflets on nuclear costs, a charter to read out, a little street theatre, a large bill of all the losses made on nuclear "research and development", the giving of token sums to the electricity board for research into alternatives and a small speech can attract a large crowd. It is also an easy way of getting our case into the local newspapers, and television.

Gloucester Alternatives to Nuclear Technology found this out (much to our surprise) when fifty of us demonstrated outside the local electricity showroom. We got a good local press, and a six minute feature on local television.

MOBILISING ELECTRICITY CONSUMERS AGAINST NUCLEAR POWER

Our next step is to put on Street Theatre in Stroud, Cheltenham and Gloucester, and to set up an information stall on a Saturday near the electricity showroom. On the consumer campaign front, we are trying to contact all local consumers' consultative committee members (addresses from yo local electricity Consumers' Consultative Committee via your Electricity Board) to ask them to discuss the issue. Also, we are trying to get 1000 people committed to acting together the consumer front. (e.g. over Tonnex). So if you are prepared to do this - it may involve a national switch off, demonstrating outside showrooms, leafletting etc. at the same time please write with name and address to Hugh Norman, GANT, 37 Bisley Road, Stroud.

We have decided that redirecting the money for our electricity bills i.e. sending cheques to Tombs, England (CEGB) or Benn personally, may be better than not paying/withholding, which will lose us a lot of public support.

We believe that the consumer campaign could in the long run be a very good way of involving many ordinary people who would not otherwise be interested in direct action.

four days will incorporate a festival of alternative technology, designed primarily for local people, as well as a wide variety of other entertainment (The Last Anti-Nuclear Festival from London's Almost-Free Theatre are already committed to being there). The latter half of the Gathering will allow time for small group discussion and decision-making on the character and nature of a proposed mass nonviolent direct action on the Monday (May 7th). The Gathering is designed so that everyone can participate in the way which they feel is most appropriate.

GROUPS PREPARE

From now till May, groups and individuals everywhere, who are concerned about their future will be spreading publicity, organising transport, arranging displays, exhibitions, entertainment and — crucially — preparing themselves for nonviolent direct action and the consequent risk of arrest. TORNESS 79 will demonstrate the strength of the anti-nuclear movement in this country, and will show the government and the SSEB that people simply refuse to allow such a dangerous and unnecessary burden as Torness to be foisted upon them.

SCRAM ENERGY BULLETIN CREDITS

This bulletin has been produced bi-monthly since November 1977. This may develop given time and resources. This edition has been typeset to enable us to fit more in — nearly double the volume with unfortunately double the costs. However, we have always run it as a slight loss-leader and are very grateful to all those who are generous with their subscriptions. The editorial group welcomes unsolicited contributions especially any drafts for a possible major feature — "Why we are opposed to Nuclear Power" for the May edition.

Next copy date is 19th March.

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We are always keen to exchange newsletters or bulletins with other campaigns both nationally and internationally.

ALLIANCE NEWS

More than 80 representatives from groups in the Torness Alliance met in London on the last weekend in January. Though the structure of the Alliance, how to conduct our meetings and the longer term perspective were discussed, the main topic was planning for the May Gathering.

As a first step various groups and individuals agreed to act as contacts for working groups. This does NOT mean they will do all the work and they will rely entirely on people like you offering skills and ideas and help.

Publicity: Safe Energy Group, 73 Walmgate, York. (0904 37355)

A.T. Displays: Mike Daligan, 37a Chatsworth Road, Harrogate. (0423-57041) and Frank Ledwith, c/o SCRAM or (031-669-3924)

Theatre Groups: John Goodwin, c/o 108 Salisbury Road, Cathays, Cardiff (0222-24525)

Music: Tommy Shepherd, 74 Carnegie Ct., Dawn Street, Hillhead, Aberdeen (0224-572751x45d) with Marion Levitt, c/o SCRAM or (031-557-0229d)

Exhibitions: Norman Duncan, 97 W. Burn Rd, Aberdeen (0224-23591)

Playground: Jenny Whitman, 38 Northways College Cres., London NW3 (01-586-4753)

Torness Handbook: c/o Angela McKee, 6 Cintra Ct., Patterson Rd., Upper Norwood, London SE19.

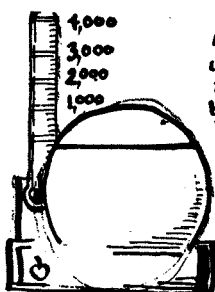
Site Co-ordination: Mike Spring, c/o SCRAM or (031-554-6908)

Trade Unions: Tony and Mike working with TUCAT from Scram Office.

The next May Planning Meeting, to which delegates from Alliance groups are invited will be on 17/18 February in Lancaster. Contact Martin 74 Dale Street, Lancaster (0524-2659 or 63021).

There will be a major Alliance meeting 24/25 March in Birmingham. The Saturday will cover the longer term strategy and structure with the Sunday for May planning. Contact Ian, 54 Allison Street, Digbeth, Birmingham 5 (021-643-7200).

Send SCRAM a s.a.e. if you wish to contact your local group who will be planning transport to Torness in May.



At our budgeting meeting last night, we reckoned we need to raise at least £3,500 by June.

CAN YOU HELP?

X Lin
(TREASURER)

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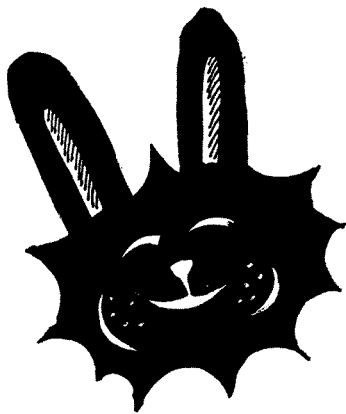
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We suggest £2 for ordinary sub; £3 for overseas; £6 for institutions. Minimum £1 sub. Any extra donations will be used solely for campaign work.

SUBSCRIBE NOW!



Little Black Rabbit stumbled on the following bewildering series of assertions while wandering through the current issue of that famous tabloid BNFL News:-

"It's unlikely to deter anti-nuclear protesters but, says the Institution of Nuclear Engineers 'Those attending demonstrations will receive more radiation from the human bodies present than they would from all of Britain's nuclear power stations.'

This is just one startling fact from the Institution's recently published 'Statement on the Use of Fission Reactors.'

The Institution tries to decide what sort of risks people accept in their everyday lives, claiming that nuclear energy is the safest viable means for generating electricity.

'There's more radioactivity in a bottle of milk than in a pint of the liquid discharged from a nuclear power station,' says the Institution.

While appreciating public fear of a nuclear accident, that fear is partly due to misinformation, says the Institution. The worst conceivable nuclear accident - a discharge of radioactive particles into the atmosphere - has already happened, when an early military reactor at Windscale caught fire in 1957. No one was injured and the consequences were trivial, says the Institution."

Little Black Rabbit wonders if the wholesale slaughter of farm animals and the pouring away of 2 million litres of milk was trivial - but he's glad to be assured by such an estimable body that "the worst conceivable nuclear accident..." has already happened (or has it?).

THE EXPERT VIEW....

This piece was printed right beside a report of Rothschild's now totally discredited Dimpleby lecture on Risk which was headlined "Nuclear Energy - the expert view". We understand Rothschild himself has acknowledged he could drive a coach and horses through his "risk analyses" but lamely suggests the need for more discussion. Little Black Rabbit can only agree - and like many others he demands access to sources of information and an open debate without the carefully laundered half-truths of the industry.

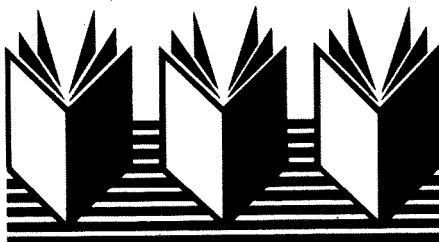
RASSMUSSEN WHITE-WASH

While on the subject of risk, latest news from the States is that the Nuclear Regulatory Commission (NRC) has requested the infamous WASH-1400 Reactor Safety Study prepared under Prof. Rasmussen be withdrawn. Even the NRC now has doubts about the validity of the 'fault-tree analysis' used in the study. Another nail in the US reactor industry's coffin was an 8 page long review of that industry in the authoritative Business Week which concluded that nuclear power was totally uneconomic and could not be justified on grounds of "plenty of cheap energy...."

Little Black Rabbit asks what the US industry can justify and wonders whether production will revert back to the siamese twin: nuclear armaments....

Little Black Rabbit

BOOK REVIEW



NUCLEAR POWER FOR BEGINNERS
Stephen Croall and Kalanders Sempier
(Writers and Readers Publishing Co-operative) £3.50/£1.80. (On our Mail Order List)

Divided into eight chapters, the guide begins with a warm invitation, remarking that nuclear power is complicated but not that difficult, and immediately I felt drawn in. The style is fast, furious and very dense, covering a great deal of ground in its 165 pages. The cartoons are marvellous and based on a thorough understanding of the issues involved. Also, in contrast to most of the books available on the subject, emphasis is put on the political and social consequences of plugging in to nuclear power.

Despite some reservations the book does attempt a holistic view of nuclear power and alternatives which is in itself a daunting task. It did amuse me and it does contain all the hard information that's sorely needed. At times it isn't clear enough because it's scattered through the book, but I did learn that fast breeders take time to produce more fuel, namely 10 years; that electricity as a form of energy accounts for less than 10% of energy used; and that the nuclear lobby continues the process of ripping off the Third World yet again.

Jill Sutcliffe/Peace News

For your Diary

Open your Big Red Diaries (still a few left - a snip at £1.60 from SCRAM), and jot down the following dates and events:

- 14 Feb New Group meets in Gala-shiels. Contact: 089-685 311
- 15 Feb SCRAM and CND Film Show with The War Game, 7.30 George Square Theatre, Edinburgh.
- 17/18 Feb T.A. May Planning Mtg. Lancaster.
- 23 Feb Anti Nuclear Ceilidh: Victoria Ballroom, Dunbar.
- 24 Feb Sevenside Alliance Mtg, Bath Contact: 0249-414089
- 23 Mar New group/party in Eyemouth. Contact: Dorothy Wilkinson, 39 Hurker Crescent, Eyemouth.
- 24/25 Mar Torness Alliance National Meeting in Birmingham.
- 7 Apr Prov. Robert Jungk Mtg, Edinburgh.
- Fri 4 - Mon 7 May Torness Gathering
- 2 June CND Rally, Faslane, Nr. Glasgow.



SCRAM- What is it?

The Scottish Campaign to Resist the Atomic Menace (SCRAM) was established at a meeting at Torness Point in East Lothian in November 1975. 'SCRAM' in nuclear jargon means to shut a reactor down in emergency. Our aims are:

1. To inform the public of the present and proposed nuclear developments, and their social, political and environmental consequences.
2. To oppose by all nonviolent means the further development of nuclear power in Scotland and elsewhere.
3. To press for a long term energy strategy based on conservation and the use of renewable resources.

SCRAM is a member of the Torness Alliance and works closely with many other organisations. We have organised several nuclear site occupations and other national protests. We have held public meetings, given talks, film shows and so on to establish links with all sectors of the community.

SCRAM is strictly non-party political. We are funded solely by donations and sales of literature. We desperately need a regular income and ask all our friends and supporters to fill in the Bankers Order Form. It's painless (the Manager does it for you) and £1 a month from 200 friends would give us £2,400 a year; £5 a month from 100 would give us £6,000 a year.

**HELP SCRAM FIGHT FOR A SAFE
AND SANE ENERGY FUTURE!**