The Anti Nuclear & Safe Energy Journal

SCRAM

NUCLEAR POWER? NO THANKS

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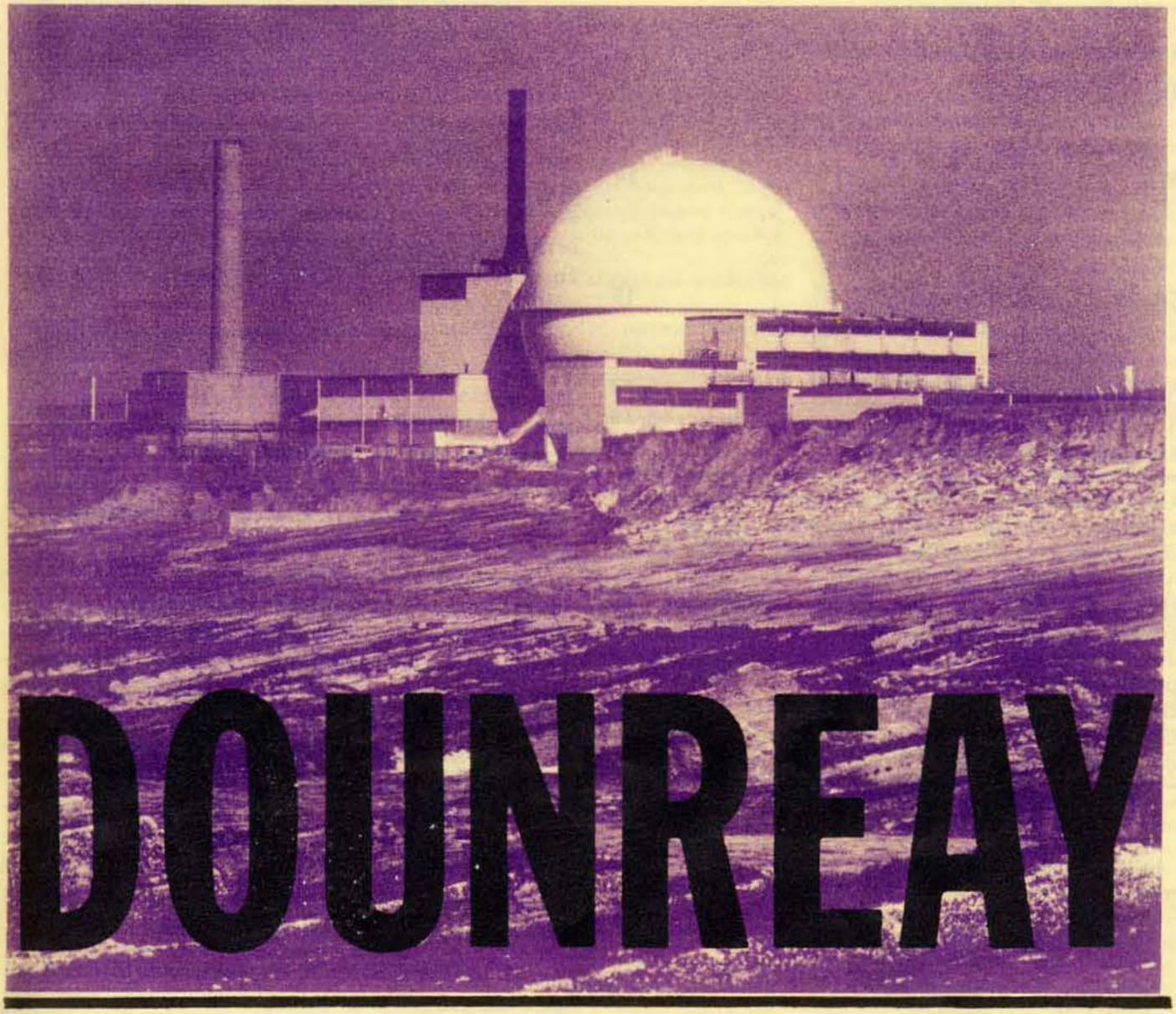

DOUNREAY

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Dounreay Broadsheet

Nuclear Leeks!

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APOLOGY

In the review of books on Space Weapons (p22 SCRAM 48) the phrase in the third paragraph should read 'military satellites can be both destabilising in that they make nuclear war-fighting more feasible, and stablising in that they provide early warning of attack and verification of arms control agreements.' We missed out some words which considerably altered what the reviewer meant.

Comment

On May 24th Alistair Goodlad, junior Energy Minister, announced that the Department of Energy will be supporting the application by the UKAEA and BNFL to construct the European Demonstration Reprocessing Plant (EDRP) to handle spent fast reactor fuel at Dounreay on the north coast of Scotland. Although this application had been publicised last autumn, the manner and timing of the announcement came as a surprise to the anti-nuclear movement.

It has long been realised that the activities at Dounreay deserve national prominence, but understandably the campaigns against Windscale and Sizewell B have taken much of the movement's attention recently. However, the EDRP proposal has instilled in us a sense of urgency so we have produced the enclosed four-page broadsheet on Dounreay to assist campaigners to publicise the hazards of this ludicrous proposal.

Looking at the plans one can believe that the applicants have gone out of their way to devise the worst possible scenario: highly radioactive spent plutonium fuel will be shipped across the congested and inhospitable North Sea from the European mainland (remember the Mont Louis?) and the plutonium recovered will be flown back to the continent in a powder form (one millionth of a gramme can cause cancer if inhaled) – this operation will take place approximately weekly. We are told that an option exists for the resulting high level waste to be returned to the country of origin; this option has never been exercised at Windscale.

A public inquiry into the application is expected to begin 'in the new year and will run for 'months rather than years'. On page 3 Ian Leveson explains why the inquiry postulated by the Scottish Office (with Cabinet backing) will be totally inadequate to deal with this sort of development and identifies alternative tactics.

It hardly needs to be said, but SCRAM will put all its efforts into this campaign and, with the broad support of the anti-nuclear movement and other concerned groups, we will show this scheme up for what it is – a last ditch attempt by the UKAEA and BNFL to stay in business. We must therefore reiterate our appeal for donations to fight this campaign – many have already given but we still need lots more to halt this headlong rush into the Plutonium Economy. Tell your friends and colleagues. Thank you.

COVER PHOTO: MARTIN BOND

Dounreay ~ The Rigged Inquiry

Like nuclear power, fast reactor (FR) research has had all-party support and the unquestioned blessing of every government since 1955, receiving steady funding in excess of £100m per year (1984 prices) despite repeated failure to achieve progress towards building the first Commercial Demonstration Fast Reactor. Originally envisaged for 1970, the CDFR is now admitted to be not possible until 2015. This has not attracted much public or parliamentary scrutiny. The project is still fostered and protected by the Dept of Energy (DoEn). Ian Leveson now examines the latest example of Governmental obfuscation.

The DoEn made an approach to join the European FR development programme prior to their review of the British FR programme, completed in November '82. The review supported further development, as national strategic policy: its details are confidential.

Following negotiations during summer '83 a European Collaborative Agreement was signed in January '84.

However, the House of Commons Select Committee on Energy, sitting after the signing, was not allowed to question the programme and 'regretted...that none of the details of the review (had) been published.' It criticised the lack of stringent assessment of the FR programmes compared with the severe cost criteria imposed on renewables research.

The current Conservative Government has ignored the recommendation of the Flowers Commission and its acceptance by the Government of the day that 'the issues should be carefully appreciated and weighed in the light of public understanding' before an FR programme is embarked upon. The Government stated that the European Demonstration Reprocessing Plant (EDRP) decision will not 'prejudge any decision to be taken on the timing and siting of a commercial fast reactor in this country.'

Application Called In

So much for Parliamentary control of major investment programmes; and so much for assurances given by successive governments that there would be a full public inquiry before Britain embarks on an FR programme.

In late September '84 the UK Atomic Energy Authority at Dounreay announced that it wanted to bid for the EDRP to safeguard threatened jobs there. The UKAEA found willing allies in the Highland Regional and Caithness District Councils and the local SDP MP Robert MacLennan. A lobby from Highland Region in April '85 paid off with the announcement of the Government's backing for the UKAEA/BNFL proposal on May 24th. The Secretary of State for Scotland called in the application in mid-June and stated his intention to hold a Public Local Planning Inquiry (PLPI) because 'the proposed development had implications of greater than regional importance'. The Public Notices appeared in the Scottish Press on June 14th, allowing 21 days for representations.

Planning Inquiry Commission

At PLPI's, matters of national policy are not considered to be material to the planning law. Although some discussion was allowed at the Windscale and Sizewell inquiries, the Windscale report ignored the evidence (we await the publication of the Sizewell report). The Town & Country Planning Acts make provision for a Planning Inquiry Commission (PIC) where the proposed development:

1 involves matters of regional or national importance;
2 has scientific or technical aspects which are unfamiliar;
3 has related activities at other sites; or
4 has been considered for other sites.

Although a PIC can examine national policy and make recommendations on policy which the planning minister must then consider, no PIC has ever been constituted. (The Roskill Commission into London's third airport which was similar in format predated the 1971 Planning Act). Following the Sizewell inquiry the Town & Country Planning Association has recently made a number of recommendations on the conduct of PLPI's, stressing that policy and site specific decisions cannot be easily separated: under existing law only a PIC is suitable for consideration of the Dounreay proposals.

Growing Concern

Despite the Dounreay management's assurances that its plant is considerably cleaner than BNFL Windscale, the news that a commercial reprocessing plant might come to Dounreay has been greeted with growing concern and anger among residents of the area. The Fishing, Farming and Tourist industries will be threatened by the plant and are already very worried how much effect the mere **threat** will have on them. For the first time Caithnessians have openly expressed concern about the nuclear industry.

The Island Councils of Orkney, Shetland and the Western Isles are cooperating in their opposition against the plans, as are the environmental groups in the North, under the umbrella 'Campaign Against the Dounreay Expansion (CADE)' which includes the Dunters from Orkney, the Wick-based Nuclear Reprocessing Concern Group, the Highland Anti Nuclear Group and RADE - Rossshire Against the Dounreay Expansion - a newly formed group opposing the spent fuel transport route from Invergordon (the port of entry). RADE was formed despite the Government's thinly-disguised attempt to buy off the Easter Ross communities with the promise of jobs (900 jobs were lost when the aluminium smelter closed in 1981). The Highland Regional Council has reserved its position until consultations end at their next meeting in September - they may still be swayed by public opinion.

Particles

Several recent events have fuelled the opposition case. BNFL's court case for the October '83 slick caused the UKAEA to attempt to distance themselves at an early stage by claiming that it is they who will be **running** the plant and BNFL will only be raising the finance. However, particles discovered on the Dounreay foreshore in 1984, which were claimed to pose 'no hazard to the public', have since been estimated to have been as radioactive as the Cumbrian beaches after the '83 slick.

Also, a week before the announcement of the planning application, the Government quashed a £200m European grant for agriculture in Highland Region - this is coincidentally the same figure as the cost for the EDRP.

During the Low Level Radiation Conference in Gloucester, a letter to the Scottish Secretary was drafted which attracted signatures from MP's, MEP's and environmental groups. It called for: at least one year's delay before the Inquiry should begin; funding for objecting groups; the constitution of a PIC; and an early meeting with the Scottish Secretary. His reply at the end of July refused a meeting and funding, reaffirmed his commitment to a PLPI and did not confirm a starting date.

We reserve our position pending a coordination meeting during August.

URENCO has steadily increased its share of the European enrichment market now standing at 13%. They expect to expand their share, especially after the US contract won last year. All three partners are now building new centrifuge plants to cope with an expanding order book.

BNFL News July '85

Uranium

The United Nations is to take the unprecedented step of legal action against URENCO in the international court of justice later this year. URENCO, which specialises in the enrichment of uranium is owned jointly by the British, Dutch and West German governments.

The UN claims that URENCO has been enriching uranium from Namibia since 1980 in contravention of the UN declaration that the occupation of Namibia by South Africa is illegal because natural resources are being exploited without the permission of the Namibian people.

Repercussions could be wide ranging in Britain and West Germany, and could be decisive in determining URENCO's future, if the action is successful.

A footnote to this story indicates how sensitive URENCO's position is. The day after the original story appeared in the *Financial Times*, a correction was printed: 'Contrary to a report in yesterday's FT, URENCO. . . does not enrich uranium for military purposes'. So now we know!

Financial Times 2.7.85

On 27th June members of the Campaign Against Nuclear Transport (CANT) blockaded the nuclear flask loading gantry near Bridgewater in Somerset. They delayed the loading of the flask onto the rail transporter for 45 minutes.

CANT had monitored the movements of flasks from Hinkley Point B nuclear power station for 3 months prior to the action, so on the day they were able to move in just minutes before the transporter arrived. They chained themselves to the gantry compound gates. The chains were eventually cut and six people were arrested and charged with obstruction. They were later fined £25 each.

Following the blockade CANT leafletted Bridgewater whilst they toured the town with their own flask. The mock flask finished its journey at the Magistrates' Court.

Contact: CANT c/o 30 Brighton Road, Redland, Bristol.

Windscale

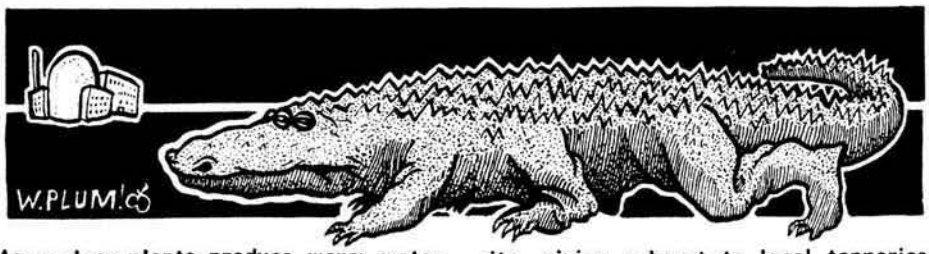
Just as we go to press the result of the court case against British Nuclear Fuels was decided. The company was fined £10,000 for incidents which led to the contamination of 20 miles of Cumbrian beaches in October 1983. The Jury decided that, although the discharges did not exceed authorised limits, they were not as low as reasonably achievable. BNFL have also been ordered to pay prosecution costs up to £60,000.

The fine may seem ridiculously low compared with the effect the incident has had on the local tourist, fishing, and agriculture industries, besides the incalculable effect the discharge of such large quantities of radioactivity could have on the health of the children of Cumbria, but it represents a remarkable advance. It proves that a large company like BNFL can be taken on and they can be found guilty of failing to comply with discharge conditions, failing to keep adequate records and failing to take all reasonable steps to minimise the exposure of persons to radiation.

Greenpeace, who discovered the slick when their divers were examining the discharge pipe with the aim of blocking it, are 'delighted' about the result. George Pritchard said that this case 'will open the floodgates for claims against BNFL. Local industries will be lodging claims for compensation. What matters is not the size of the fines but the fact that this will be another step towards zero discharges. The limit has already been cut from 6000 curies to 600 so any discharge of this sort in the future may be beyond the authorised limit.'

Let's hope that finally, after living under the shadow of Windscale for so long, the people of Cumbria will be able to receive some redress from BNFL. The company's chairman, Con Allday, said that, 'of course I am disappointed but I am not commenting any more at the moment'. He stressed that procedures had tightened at the plant and said that BNFL 'will be giving serious consideration to the implications of the verdict'.

Crocodiles



As nuclear plants produce warm water as a by-product it does seem a pity to waste this valuable commodity, or so it seems to the French at Tricastin in France. The Commissariat a l'Energie Atomique are to breed crocodiles on the site, giving a boost to local tanneries and shoemakers. This project seems to add a new dimension to the idea of energy conservation - a case of the l'Energie Atomique crying crocodile tears.

FT Energy Economist June '85

The PWR at Davis Besse in Ohio built by Babcock & Wilcox and operated by Toledo Edison had an accident on June 9th similar to that of Three Mile Island.

Davis Besse shut down last month. Investigations are being carried out following a 12 minute loss of coolant. (In the two years 77-79 there have been 20 incidents involving loss or partial loss of coolant.) On June 9, while working at almost full power, a feedwater pump stopped working. The Emergency system acted but a series of valves closed, preventing secondary feedwater pumps from working. Reserve pumps came into play briefly before shutting down. The Plant was without feedwater. A pump with half the capacity was used until an auxiliary pump came into operation twelve minutes later.

As at Three Mile Island, when pressure rose in the primary circuit, a relief valve opened periodically but, because of malfunction, stuck on the third operation. At Davis Besse it was open for a minute compared to two hours at TMI.

The Nuclear Regulatory Commission (NRC) has been heavily criticised for not insisting that an electrically powered auxiliary pump or alternative be installed to replace the present steam driven pumps, as had been recommended in May 1980. The Davis-Besse PWR is unique in both main and auxiliary pumps being driven by steam generators. In the case of loss of feedwater and the steam generators boiling dry there would not be anything to drive the pumps. If an electrical pump had been in operation, the valve's failure would have had a similar effect on the operation, however. Controversy continues.

New Scientist 11.7.85

Reactors

Following completion of the Phillipines' first nuclear power station at Luzon on the Baatan peninsula in June, the pylons were promptly blown up by rebels. The 620MW PWR was the most expensive of its kind in the world, and great controversy surrounds its design and the questionable dealings between Westinghouse and Herminio Disini - a relative of President Marcos.

The reactor is built on the slopes of two dormant volcanoes in the vicinity of an undersea earthquake fault. The US Nuclear Regulatory Commission was invited to assess the plant's safety and found that volcanic hazards had not been adequately catered for in the design.

The design was based on a plant for Puerto Rico which was never built. Westinghouse paid Herminio Disini $35m commission on that contract. The eventual cost, although difficult to ascertain, is certainly over $2bn compared with an original estimate of $500m in 1974. The Government is paying $350,00 per day in interest charges. Its generating costs have been estimated as 2,500% higher than hydro and even 500% higher than oil.

New Scientist 11.7.85
WISE News Communique nos 228 & 231

The Sizewell B inquiry was held in a 700 year old church. In commemoration of the two year inquiry the CEGB will spend £1600 illuminating the building. The churchwarden, Mr Langley, is 'delighted that the board should make such a generous gesture to the village'. Is this an omen? Will the CEGB see the light after the event? Maybe Mr Langley should note that the board could be very generous and not bother building Sizewell B after all... or maybe the CEGB now has pangs of guilt that it did not reveal all its plans during the inquiry.

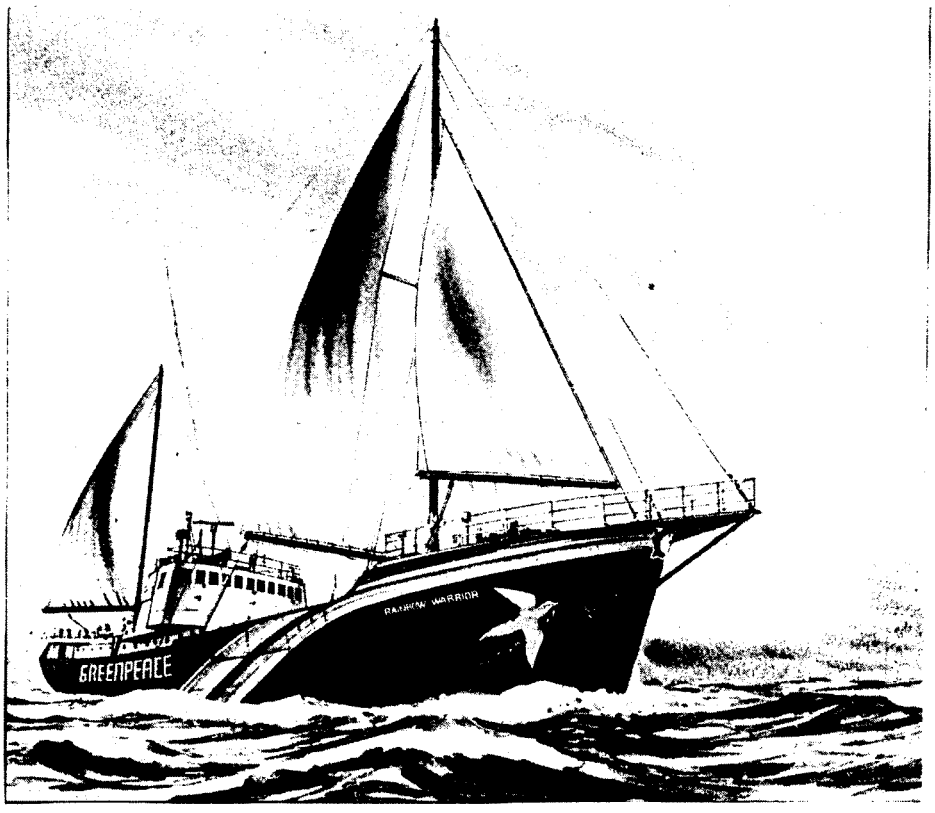
CEGB Newsletter

CEGB

The Central Electricity Generating Board still have plans to build a nuclear power station at Portskewitt in South Wales. This fact emerged recently from consultations carried out by Gwent County Council.

The County Council proposed changes to its structure plan which involved the construction of 500 houses to the north of Portskewitt. The CEGB and the Nuclear Installations Inspectorate (NII) objected to these changes on the basis that the building development would inhibit future use of the site which they have earmarked for a nuclear power station. They had to remind the Welsh Office that the CEGB still had consent under the Electricity Lighting Acts to build a nuclear power station despite the fact they had withdrawn the application at an earlier date.

Greenpeace



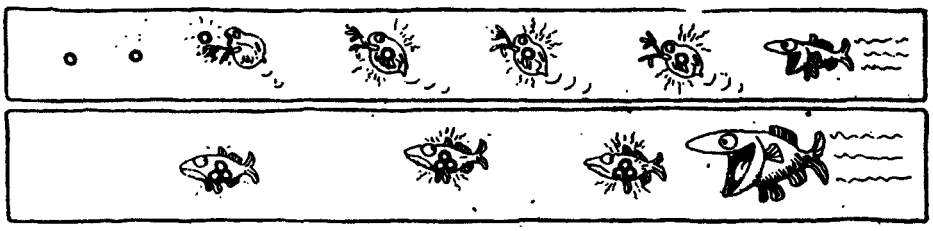
A couple have been arrested and charged with murder and arson by New Zealand police for the attack on the Greenpeace ship *Rainbow Warrior* which was sunk in Auckland harbour by limpet mines which blew two 8ft holes in her side. Fernando Pereiro, the ship's photographer, was killed. The ship was preparing to lead a flotilla into the French nuclear test site in the south Pacific.

The couple were travelling on false Swiss passports and had been held in custody for ten days before being charged. The New Zealand Prime Minister, David Lange, expressed his anger at the attack and said, 'We have implications of political terrorist overtones. Greenpeace, of course, has enemies for a whole lot of causes.' However, he went on to say that they have also 'made millions of friends...around the world'. This incident has been made all the worse because of New Zealand's nuclear free stance.

Greenpeace has launched an appeal for Fernando's children. Send donations to **Greenpeace, 36 Graham Street, London N1.**

Background Radiation

Myths abound concerning background radiation and its effects on living things. The Nuclear Industry consistently uses it as a justification for discharging radioactive materials to the environment. In this article, the next part of his series on nuclear waste, Don Arnott seeks to dispel some of the myths and put into context the hazard background radiation levels represent.



From time to time the notion raises its ugly head: we live in a radioactive world, we survive, obviously it's doing no harm, so what does it matter if we add a little more radioactivity to the environment? Consider this: -

> *It is undoubtedly true that exposure to high levels of radiation can cause cancers, but there is absolutely no evidence that the public are at risk through exposure to radiation within the variations of natural background levels.*

Half-truths of this sort abound: they do not yet reach the point of stating that radiation is good for you, but there is a clear implication that our worries are rather silly. What matters about this quotation is that its author, Peter Adams is a member of RWMAC (the Radioactive Waste Management Advisory Committee). He is also a member of the TUC Fuel and Power Industries Committee and is Chairman of the TU side of both the United Kingdom Atomic Energy Authority and British Nuclear Fuels Limited Negotiating Committees.

To be fair to Mr Adams, the article from which I have quoted* contains no other whoppers like this, even though it is highly slanted. But underlying his contention are these deadly assumptions: because we can't see it therefore it isn't happening; we know it all; or at least, enough.

Too Soon To Tell

Radioactivity was only discovered in 1895; its genetic effect in 1927: its mass-use is a bare 30 years old. Why is it to be assumed that we know all about the long-term effects? The tragedy of nuclear power, and its most specific danger, lies in this: that for at least 100 years, and quite possibly longer, we cannot possibly know all the things we need to know now. For that situation the wise rule applies: when in doubt, don't.

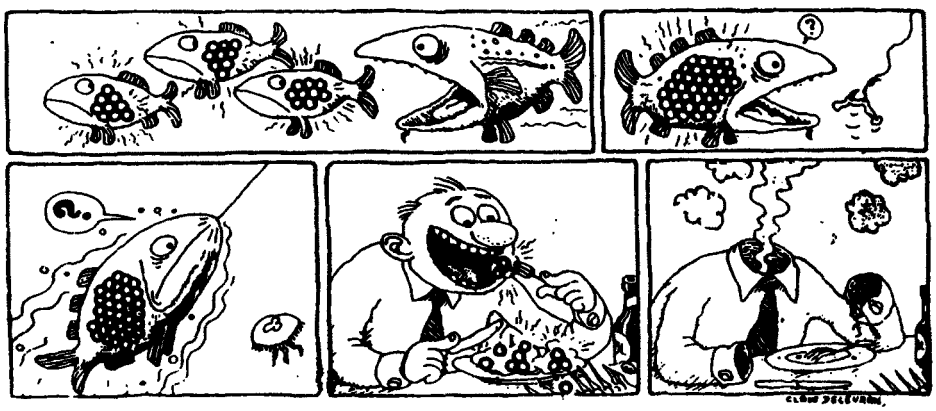
So what is the real significance to us of the natural radiation background? And what, specifically, are the dangers of our adding to it? To answer these questions I must go back to fundamentals.

When a radioactive particle or gamma-ray traverses living tissue it produces hundreds of electrically charged particles, called ionisations, in the atoms lying along its path. Each ionisation sets off a chain-reaction of complex chemical events, by no means fully understood as yet; and, under certain circumstances, as little as one ionisation can kill a cell. And that is the normal response: cell-exposure is followed by cell-death, usually taking place at the next cell-division. There is another and rarer response; we shall come to it later.

No Threshold

It sounds drastic; and at the cell-level, so it is. But cells die and are replaced the whole time, from their own old age and from injuries of many sorts. Skin cells last about a month, red blood-cells about a hundred days, some circulating white blood-cells a few hours only: you are not the same person as you were when you got up this morning.

It follows that, *for this sort of effect*, provided that radiation damage does not exceed the capacity of the tissues for regeneration, there exists a threshold of exposure below which no ill-effects will be apparent. This does not mean that nothing is happening; it means that regenerative process can cope. It is this alone which makes it possible to work with radiation at all, as in medicine.



But there is another effect. Much more rarely the exposed cell does not die. Instead it turns malignant and begins to multiply without regard to its surroundings. This is cancer, in which category we also include leukaemia. Or, if a reproductive cell is involved, it may undergo mutation. Again - with all possible respect to Mr Adams - as little as a single ionisation can do it. There is therefore not threshold; risk diminishes with dose but is never wholly abolished. And, despite the fact that these effects are much rarer than threshold effects, it is they that must rule our judgements as to what is, and what is not acceptable practice. Those judgements, moreover, must take into account that the whole of the living world is at risk and not ourselves alone.

It is far from easy. It would be wise to assume that we have not discovered all the biological effects of radiation. We have no complete understanding of what causes cancer. There are often delays between exposure and injury, sometimes of many years; and the injuries themselves are not specific to radiation but can be caused in other ways. It is thus, in the present state of knowledge, extremely difficult to relate cause and effect.

Knowledge is Limited

The natural radiation background consists of terrestrial radioactivity (including that inevitably incorporated into living things) and cosmic radiation coming from outer space. It behaves in exactly the same way as any other ionising radiation: day by day it produces injury and death; and, over the millennia, it might perhaps produce 1-2% of known human cancers. But nobody knows: our methods of estimation and our accumulated experience do not yet allow it. Again, this is not surprising when one reflects that most of the fundamental knowledge we have is less than 100 years old. Nonetheless, there is no denying the fundamental radiobiology of the matter.

Specifically, what has happened is this. Life, originating on this planet against odds which include a radioactive environment, has evolved into species which can stand radiation loss. Other species, which could not, no doubt went to the wall.

But there is a more specific definition of the matter; and with it we reach

the crux of things, the point which the nuclear industry has always missed and seems determined to go on missing. For it is no more than a half-truth to say that the living world survives in spite of radiation. The whole truth is this: that it survives in spite of the damage done by the existence of *certain radioactive substances* in the evironment.

Radiation-induced mutations

The vital difference is best illustrated by example. Amongst the many free-living protozoa in the sea are many which build shells of chalk (Calcium carbonate) or silica. But there are also a few which construct their shells, not of chalk but of the closely allied Strontium carbonate. (They must have a hard time of it. Strontium is not a common constituent of seawater.) Clearly they are no more at risk than any other species from the presence of Radium and Uranium in the sea. But then some smart-ass up at Windscale starts putting in Strontium-90 - and putting in more than he need, too, to see what happens - the protozoans start building it into their shells and their future prospects darken at once. They can survive sea-water Radium. They are not adapted to radioactive Strontium: evolution has never met it before and it is likely to respond in its usual ruthless fashion.

And the same goes for every artificial radioelement we make. 'Because the Irish Sea contains Radium, it does not in the least follow that it is safe for us to put Plutonium into it as well.' It is the thirty years since I wrote that in a book and the lesson has still to be learned. The Industry sees only radiation. It refuses to see radiochemistry.

But does it matter if a few protozoan species disappear in this way? As a detail, nobody knows, but as a principle it is vital. All species interdepend and it is the inter-relationships between them that are so vulnerable to environmental change. A small decline in a food resource may wipe out a species dependent on it. We have seen the calamitous effects of ill-judged pesticide use on food chains. But even more central to my argument is the question of targets.

There are only 5000 million human beings on the whole of the Earth's surface. But there frequently are as many unicellular organisms on any square yard of it. Nuclear war apart it is not very likely that many of us will suffer *direct* radiation injury from nuclear adventurism: we are too few and most of the radiation will miss us. By comparison the sheer stopping power of micro-organisms for radiation, above all their potential for genetic change so induced, is immense. If we start messing around with the world's microflora and fauna in a random fashion there is no forecasting anything about the ultimate consequences except that they are unlikely to be suffered by Mankind as the price of its nuclear activities is more likely to take the form of some gross interference with our food supply or the emergence, through radiation induced mutation, of malignant varieties of micro-organisms such as wheat rusts. None of it will happen overnight. The biosphere is not so fragile that it cannot withstand a few clouts. But we are taking a risk. And there is not technical reason which could justify it.

The Flowers Report, in one of its rare lapes into intellectual rigour, endorsed the conventional wisdom that if Man protects himself properly with regard to radiation, 'his' environment will usually be protected also; that too is the philosophy of the International Commission for Radiological Protection. Eight thousand years of human history go far towards proving that exactly the opposite is true. In fact there is no such thing as the human environment: there is merely the biosphere in which Man has his place and to all of which he is related. But we are still industriously sawing off the branch on which we sit. Shakespeare, as so often, got it right about Man: -

Most ignorant of what he's most assured.

At present, radioactive waste is not the most immediately flagrant of our offences against the living world. But, no doubt for historical reasons, it is the one which has attracted most attention and most study and where therefore there is least excuse for failure. We cannot permit any increase in global radioactivity through the release of Man-made radioelements for Nature to do with as she pleases.

*Peter Adams: 'Don't listen to scaremongers', Contact, Vol 15, March 1985. (Published by EEPTU and circulated to membership.)

Radhealth Campaign

The National Conference on the Medical Effects of Low Level Radiation took place on the weekend of the 15th and 16th June and was attended by about 120 activists and workers in the health field. The feeling of the Conference was one of great intensity and a thirst for knowledge on the subject of radiation and health.

Highly informative talks were presented by Alice Stewart, Dr Robin Russell Jones, James Cutler and John Urquhart as well as workshops. The Saturday workshops were essentially information sharing and were led by members of the medical profession; the Sunday workshops, on the other hand, were concentrated on campaigning strategies.

The final plenary session combined the educational and campaigning aspects of the Conference into practical steps which can be taken to publicise the medical effects of low level radiation. A major decision was to convene a Standing Conference which will meet annually; the next one to be organised by CORE (Cumbrians Opposed to a Radioactive Environment) and probably to be held in Kendal next summer. Until that time the campaign will be serviced by SCAR (the Severnside Campaign Against Radiation), who did such a marvellous job of organising this year's event.

The Concluding Statement from the Conference reflected the unanimous feeling of the participants that 'Information witheld from the Black Report, faulty epidemology and statistics, unscientific logic and radiology, remove all credibility from its findings', and that ' we cannot rely entirely on government institutions to take care of health in regard to radiation hazards'.

A number of Trades Unions have been campaigning for lower radiation dose limits since 1978. In this, the second article on Radiation and Health, Tony Webb reviews the progress in the light of the New Ionizing Radiation Regulations.

Standards for radiation protection are inadequate. As indicated in **SCRAM 48** these have not kept pace with developing knowledge on risks. Indeed the new system proposed by the International Commission on Radiological Protection (ICRP) will result in some relaxation of standards limiting exposure to critical organs of the body and to intake limits for many of the radionuclides encountered by workers in medicine and industry as well as the nuclear programme. (1,2)

These proposals have aroused strong resistance from a number of unions whose members work with radiation - notably the G&MBATU, ASTMS, and T&GWU. The Union position called for a reduction of the annual limit by a fac-

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Radhealth Campaign contd.

tor of 10 from 5 rem (50 μSv) to 0.5 rem (5 μSv). (3)

Needless to say, the Health and Safety Commission was under strong industry pressure not to change the limit and to introduce the ICRP system. To make any concession would break the international consensus built around the ICRP. This consensus, as indicated in the previous article, is essential to maintaining the myth of 'safety' and 'acceptability' of radiation developed under the Atoms for Peace programme. (1)

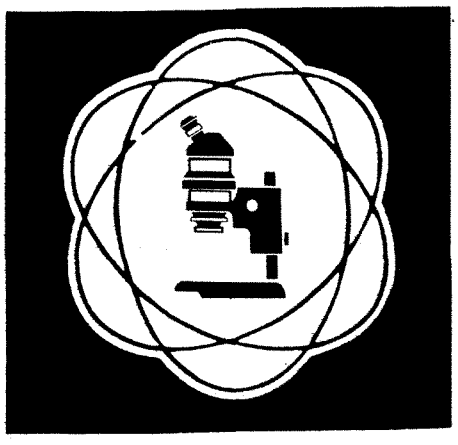
Privately the UK Atomic Energy Authority (UKAEA), the National Radiological Protection Board (NRPB) and Central Electricity Generating Board (CEGB) will concede that worker dose should be below 1 rem a year to be 'acceptable'. (4) Indeed, with the exception of reprocessing at Windscale a 1 rem limit could be met with little difficulty. The CEGB, for example, has been operating to this since 1973. (5) Once again the military interests in nuclear material is clearly dictating the terms for Health and Safety across the board.

Compensation Schemes

The Unions have made some progress however. In order to keep compensation cases out of the courts, BNFL set up an automatic compensation scheme for workers who develop cancers. In this scheme risk estimates 3½ times higher than those of ICRP are used to assess the claims. The scheme has worked fairly well for leukaemia cases but Dr Alice Stewart suggests that some *solid* cancer claims might have fared better in the courts.

The scheme is under review and a further increase in the risks of 2 to 3 times may result. The current scheme would imply a need for a 1.5 rem annual limit and any further concession would be equivalent to the need for the 0.5 rem target the unions have demanded.

The limits however remain unchanged. In defending the indefensible the industry's argument now emphasises 'real' protection is based on keeping doses As low As Reasonably Achievable - The ALARA principle. (6) 'Reasonably Achievable' being of course defined by the management not the workers. To give this imprecise value-laden principle some substance the NRPB has developed a complex system of Cost - Benfit analysis. If the cost of reducing doses is less than the NRPB formula, then improvements should be made. If more, they need not be. (7) Some small doses are defined as insignificant and discounted completely. (8)



This cattle market approach to radiation protection is not merely obscene, it is designed to obscure the fundamental issue: that radiation technology was introduced with insufficient concern for public and worker health, and the protection agencies, from ICRP down, have failed to amend the regulations to reflect the current knowledge on radiation risks.

As a concession to union pressure the new code of practice that will accompany the Regulations in 1986 will specify an 'investigation limit' of 1.5 rem (15μSv). If a worker receives more than this dose in any year an investigation will be required - not to prevent it happening again - merely to be sure that the employer is applying ALARA (cost benefit analyses) properly.

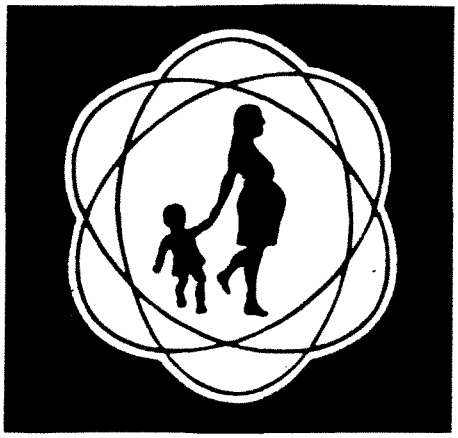
The emptiness of this gesture can clearly be seen when the Code (which is not legally binding) is compared with the regulations (which are).

Under the regulations a 'controlled area', where the employer has to monitor individual worker doses, need only be created if the dose rate exceeds 0.75 millirem (7.5 μSv) per hour. This is equivalent to a dose of 1.5 rem (15μSv) per year if the worker worked there continuously.

New Radiation Technologies

Clearly the time has come for the Unions to reconsider their strategy. On the one hand they are winning the compensation fight as the industry bends over backwards to buy peace. Prevention of radiation damage to health of their members, on the other hand, proceeds on a haphazard basis. With the failure either to win real concessions in the new regulations or to prevent introduction of ICRP-inspired relaxations in standards they are now dependent on employers being willing, voluntarily, to go beyond the inadequate provisions of the regulations.

Waiting in the wings are new technologies such as food irradiation that will rapidly expand the range of radiation uses and worker exposures. (10) These can now be introduced without real pressure to design plant with lower doses in mind. As more radiation plant is introduced it will become harder to bring about the changes that real radiation protection requires.



New Coalitions Needed

Just as the anti-nuclear movement has recognised the need for Trade Union allies so unions need to recognise that the concessions that have been won are in large part due to public relations sensitivities of the industry. These are very vulnerable to public perceptions of radiation hazards. New fronts to the campaign and new coalitions are needed. Concerned groups include communities around nuclear facilities and those along transport routes of industrial and medical as well as 'nuclear' radioactive material; Trades Unions in a wide range of radiation using technologies; workers and consumers and public health specialists concerned about the introduction of new technologies such as food irradiation; nuclear weapons test veterans; Unions and Health care professionals concerned about health damage from uses (and abuses) of radiation in medicine and dentistry; and our colleagues in the disarmament movement many of whom have yet to fully accept that we are involved in the same struggle.

The task is to bring concern about the effects of radiation out of the realm of future possiblity and into the here and now, to show that we are causing irreparable damage now and to make the victims of the atoms-for-peace-for atoms-for-war programme visible.

References

1 Article SCRAM Bulletin (June/July 85)

2 International Commission on Radiological Protection 'CRP Report 28. Annals of the ICRP Programme Press 1977

3 Submission of G&MBATU to Sizewell Inquiry 1984

4 Minutes of meeting

5 CEGB evidence to Sizewell Inquiry

6 Ionizing Radiation Regulations

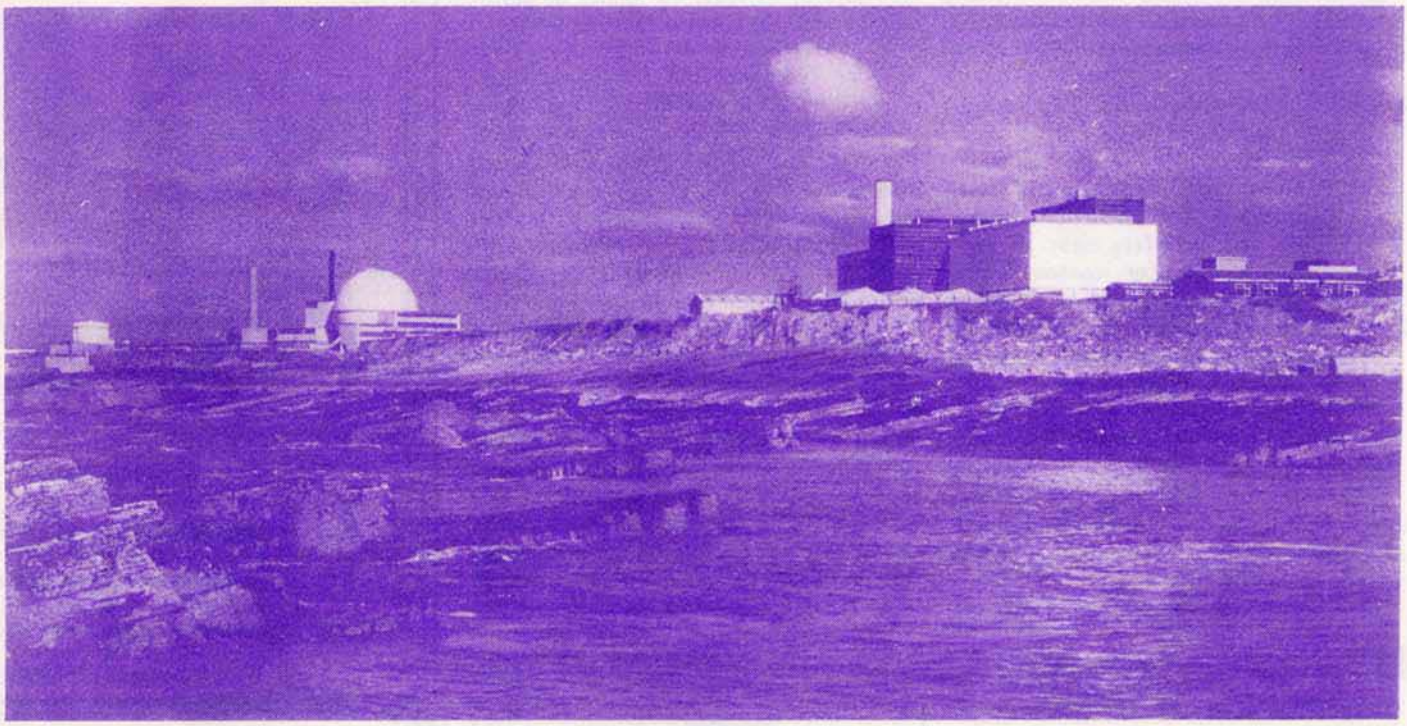
7 NRPB cost benefit analysis

8 NRPB Travel dose

9 C.O.P.

10 Food Irradiation - Issues of Concern. Paper produced by the London Food Commission Working group on food irradiation. LFC PO Box 29 London N5

DOUNREAY



In May 1985 the Government announced its support of an application by the UK Atomic Energy Authority (UKAEA) and British Nuclear Fuels (BNFL) to construct a Fast Reactor Fuel Reprocessing Plant at Dounreay, Caithness in the North of Scotland. This plant is intended to be part of a European Collaboration and represents a fundamental change in nuclear energy policy.

Because of the complexities of fast reactor technology, and the lack of precise official information, SCRAM has produced this broadsheet. It gives a brief history of the Dounreay establishment and examines the world experience with fast reactors as well as discussing the implications of the European Collaboration in energy and economic terms.

Successive Energy Secretaries have promised a full public inquiry before a Commercial scale Fast Reactor is built in this country. This promise could be reneged on by granting planning permission for the reprocessing plant in advance of the application for the fast reactor. This proposal could be seen as an admission that the Commercial reactor will not in fact be built in Britain after all and that, in order to keep the fast reactor design team together, the UKAEA and the Government have opted for the 'dirty end' of the fuel chain as the only part of the programme which the other participants don't want.

The Uranium Shortage Myth

One of the major arguments for fast reactors postulated by their proponents is the present or future shortage, and hence high price, of uranium fuel for conventional thermal nuclear power stations. Evidence to the House of Commons Environment Committee investigation of radioactive waste management casts serious doubts on the uranium shortage argument. Sir Walter Marshall, chair of the Central Electricity Generating Board, has claimed that it is cheaper to store spent fuel than reprocess it because of the glut of uranium and plutonium: the cost of uranium has fallen by over 50% over the past six year whereas the cost of reprocessing has increased by a factor of ten.

The reason for the glut can be traced back to the early 1970's and the 'oil crisis'. With the cost of oil rocketing, many top mining companies, and several oil giants, went into uranium in a big way: output of 'yellowcake' doubled between 1970 and 1980. But, demand did not keep pace due to reduced electricity consumption during the recession, growing opposition to nuclear power, and the moratorium on US orders hastened by the Three Mile Island accident.

The spot price for uranium fell from $43 per pound in the late 1970's to $15 per pound by January 1985, and stocks for up to six years consumption has been amassed when two years supply is usually thought to be sufficient. Because of the glut, exploration for further deposits has plummeted - spending on exploration halved between 1980 and 1983. Yet, the Uranium Institute estimates that projects in an advanced state of evolution could bring an *extra* 50,000 tonnes a year onto the market, increasing production to more than twice the level of demand. There is estimated to be sufficient reserves to last until the end of the 21st century.

Fast Reactors Breeding Plutonium

Fast Reactors differ from Thermal Reactors in three respects:

1. The reactor core is fuelled with plutonium or with a MOX of plutonium and uranium, not with uranium alone. In order to obtain the plutonium, reprocessing is necessary for Fast Reactors.
2. The reactor core is not moderated like a Thermal Reactor - it burns more efficiently but is correspondingly more difficult to control and to cool down. Liquid sodium cools the core and transfers heat to the turbines: it burns on contact with air or water.
3. Since there is more than a critical mass of plutonium in a Fast Reactor core, should an accident lead to core 'melt-down', it could cause a nuclear explosion - unlike a Thermal Reactor.

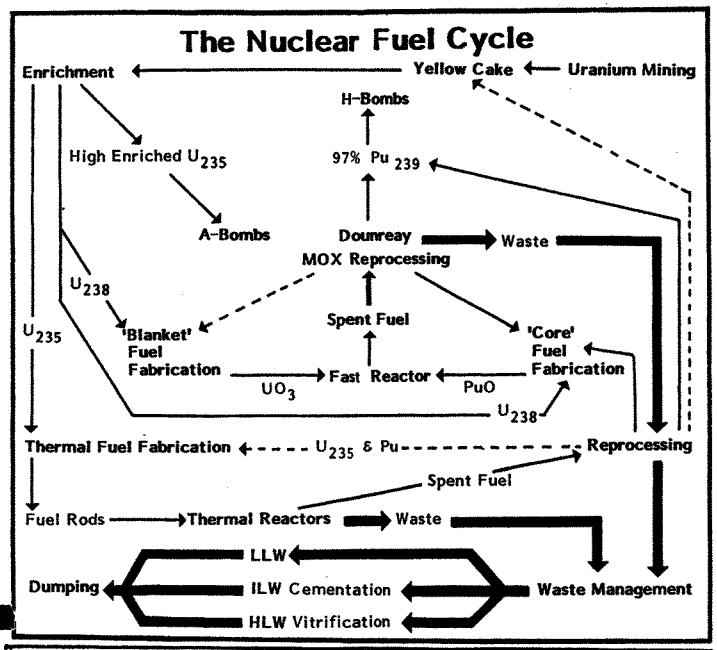
The burnt-up fuel rods are reprocessed, during which the usable uranium and plutonium are extracted, leaving various grades of nuclear waste.

The separated uranium and plutonium may then be (1) stored, (2) used in weapons, (3) recycled as MOX for thermal reactors, or (4) used to fuel further fast reactors. There is a present European stockpile of at least 40 tonnes of plutonium: ample for several fast reactors.

A Fast Reactor is known as a Fast **Breeder** Reactor (FBR) if the core is surrounded by a blanket of uranium. Under the impact of neutrons emitted from the core, the uranium blanket is turned into military grade, 97% pure plutonium 239. The alleged economic justification for FBR's is that they make more efficient use of uranium by changing it into plutonium - which then provides the first fuel charge for the next generation of FBR's.

The time needed to breed enough plutonium for a successor fast reactor is called the 'doubling time'. The proposed EDRP is to extract the plutonium from the blankets of the FBR's which are due to become operational over the next 15 years. Not all the plutonium will necessarily be recycled...some may end up in weapons.

The Nuclear Fuel Cycle



Key

H/I/LLW - High/Intermediate/Low Level Waste

proven at laboratory or commercial scale

possible but not economic

waste route

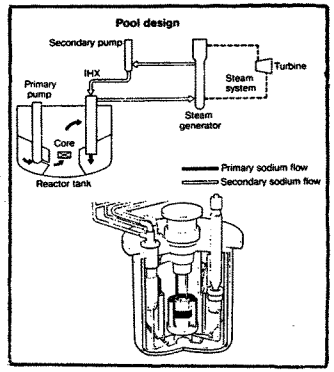
Dounreay History

The goal of producing electricity from fast reactors has been pursued since 1949. For safety reasons the remote site at Dounreay on the North coast of Scotland was chosen for the UK's first pilot plant. Construction began in 1955 and the Dounreay Fast Reactor (DFR) was completed in 1959. DFR is extremely small, rated at 60MW thermal and 15MW electricity. Since no plutonium could be spared from the weapons programme DFR was fuelled by highly enriched uranium.

Once built it was clear that the DFR design was inadequate for a commercial station so in 1966 it was decided to build a second plant at Dounreay. Originally scheduled for completion in 1971, this Prototype Fast Reactor (PFR) did not go critical until 1974 and did not reach its design power, of 600MW thermal, until 1977 and only achieved its full electrical output of 250MW in 1985.

Alongside the reactors the UKAEA built an experimental reprocessing plant. From 1959-1975 it separated plutonium and uranium from DFR fuel. In 1975 it was closed down, decontaminated and new equipment installed to reprocess fuel from PFR.

The objective of a commercial fast reactor has been continually postponed. When PFR was built it was expected that a commercial reactor would follow rapidly in 1977. By 1977, as the Windscale Inquiry opened, there was no prospect of a commercial reactor before 1979. By 1980, it was clear that the fast reactor would not be competitive unless developed in collaboration with other European countries.



Fast reactors in operation or currently under construction in Western Europe will use up to 10 tonnes of plutonium in their reactor cores. The total amount of plutonium in circulation at any one time in the plutonium fuel cycle must allow for the fuel which is cooling down prior to reprocessing, that which is being reprocessed, and that which is being manufactured into new fuel rods. This total is at least twice the quantity in the reactor cores: some 20t by 1990. If three further fast reactors are constructed, each of 1500MW in accordance with the European Agreement of 1984, the total may approach 50t by 2010.

Only 5kg of plutonium are needed to make a nuclear bomb and dispersal of 2 kg of this highly toxic substance could deliver a deadly dose to every human on Earth. Misdirection of plutonium will pose enormous risks, thus it is regarded as having unique security problems. To prevent terrorist threats all plutonium shipments are guarded by an armed private police force.

The Dounreay Expansion

BNFL (who operate the Windscale reprocessing plant) and the UKAEA applied jointly on 31st May 1985 for outline planning permission for the construction and operation of a commercial scale Fast Reactor fuel reprocessing plant. This 'EDRP' will be built and run by a European consortium whose partners have yet to be named. They indicate that planning permission will be sought also for cementation and vitrification plants at Dounreay to handle the nuclear waste by-products.

Once outline planning permission is granted, the development is agreed in principle. The detailed plans, which are probably not yet complete, are submitted later when the overall development can no longer be questioned: opponents of the plans wish to challenge the wisdom of the Government policy in support of the plutonium fuel cycle which includes the development of the Dounreay EDRP.

The EDRP will process 60-80t of spent plutonium fuel per year, extracting 6t of plutonium oxide and producing more than 260m^3 of nuclear waste. To date only 20t of spent plutonium have ever been reprocessed. The Applicants claim that discharges will not increase.

It will receive some 60 shipments of spent fuel per year by sea (via Invergordon?) and thence by rail: more than one shipment per week. There will be 60 return shipments of empty flasks and up to 200 airflights carrying plutonium oxide for fabrication into fresh fuel at Windscale or at plants abroad.

Plutonium Economy

The most profound danger in the Dounreay expansion is the contribution it makes to the development of a 'Plutonium Economy' in which the material used in nuclear weapons (plutonium) becomes an ordinary item of commerce. Beyond the middle of the next century, the electricity supply industry seems to want Fast Reactors to provide most of the base-load electricity requirements. If uranium reserves are depleted and if uranium costs increase, the 'Plutonium Economy' will be established more quickly. Plutonium will become an increasingly strategic material.

Once past a certain threshold, the plutonium economy will not be subject to Parliamentary security because of commercial and security pressures: the Plutonium Economy is incompatible with democracy. Its price is a loss of civil liberties and long-term submission to the control of a centralised technocratic elite.

Proliferation

*the plutonium could be diverted to increase existing European nuclear arsenals. Weapons grade plutonium will be separated from the *blanket*. France has already identified FBR's as the source of future weapons. In 1978, an Atomic Energy Commission advisor boasted: -

France... will be able, rather cheaply, to make large quantities of [nuclear weapons] as soon as the fast breeder reactors furnish her plenty of the plutonium needed...

*the CEGB's participation in Super-Phenix and its donation of plutonium for the reactor core implicates it in France's nuclear weapons plutonium production plans. Dounreay will reprocess plutonium from the Super-Phenix blanket, and only the spirit but not the letter of international treaties would be broken if some of this plutonium went to be used in France's 'Force de Frappe'. Alternatively, France could extract plutonium at its Marcoule plants.

*Britain's continued development of fast reactors makes nuclear developments in other countries legitimate. In particular, the separation of plutonium in countries which might divert it for weapons would add to the number of countries with nuclear forces.

Glossary

IAEA	International Atomic Energy Agency
UKAEA	UK Atomic Energy Authority
CEGB	Central Electricity Generating Board
BNFL	British Nuclear Fuels Limited
SBK	Schnell-Brueter-Kernkraft-werkgesellshaft
EdF	Electricite de France
ENEC	Ente Nazionale per l'Energia Elettrica
NERSA	Centrale Nucleaire Europeenne a Neutrons Rapides S.A.
MOX	Mixed Oxide Fuel
EDRP	European Demonstration Reprocessing Plant
EDFR	European Demonstration Fast Reactor

The European Fast Reactor Programme

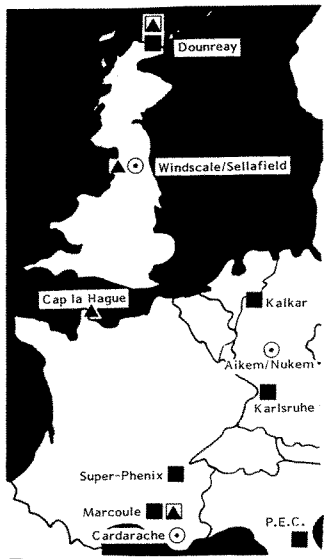
The International Atomic Energy Agency initiated international co-ordination of Fast Reactor development in 1967. Two consortia were established in the early 1970's to build and operate Fast Reactors.

1. SBK, which is owned by German, Belgian, Dutch and British companies (the British CEGB owning up to 3%), operates the Kalkar Fast Reactor in W. Germany. Kalkar does not now have a plutonium breeding 'blanket'.
2. SBK in turn has a 16% shareholding - along with the French and Italian State electricity companies - in NERSA, the consortium which runs the commercial-scale Super-Phenix Fast Breeder Reactor in France.

Both these Fast Reactors were fiercely opposed in the 1970's by demonstrations of greater than 50,000 people at each construction site, yet both went ahead.

Because of the problems with Fast Reactors, especially with their sodium coolant, a programme of three more 'prototypes' (European Demonstration Fast Reactors - EDFR) will be built by different companies before a final design is chosen for a commercial programme. In January 1984, Britain joined the group (known as Argo) which is promoting this programme. Agreeing to one EDFR each, probably for France, W. Germany, and the UK, the Government committed the CEGB to a 16% share in the first EDFR, Super-Phenix II. It will be the successor to Super Phenix 1, yet the latter will not come fully on stream till at least April 1986 and France will not order further Fast Reactors until at least one year's operating experience has been gained of Super-Phenix I.

This EDFR programme means that some £5000m will be spent on top of the R&D costs to get the design right - or as nearly right as the nuclear industry believes is acceptable. And judging by both Kalkar and Super-Phenix, this could take until the beginning of the 21st century, if they start building all three prototypes now. Before there has been any public discussion of the UK's commitment to Fast Reactors, English and Welsh consumers have been paying for the CEGB's involvement in European Fast Reactors. As the CEGB's stake increases it will pass on these costs.



■ Fast Reactor
▲ Fast Reactor Reprocessing Plant
▲ Thermal Reactor Reprocessing Plant
◉ Fast Reactor Fuel Fabrication Plant

Arguments Against

* There is no need for a Fast Reactor programme even in the medium term future. The programme distorts the Energy policies of the countries involved and absorbs funds which otherwise could go to developing renewable and non-polluting energy souces.

* The dubious technical status of Fast Reactor plants and their fuel cycle services require at least 30 years further development at enormous cost before they even approach proven commecial viability. They have no economic potential during this period so burdening taxpayers and consumers with a continuing financial subsidy of billions of pounds. To date, 30 years of Fast Reactor R&D have cost the UK £2,500m.

* Fast Reactors and their fuel cycles require additional transport and trading of spent fuel, plutonium and radioactive waste. They are more dangerous than existing nuclear power technology and increase the risk of long-term hazards to public health and environmental quality in the event of an accident. Attempts to reduce costs will exacerbate the risks.

* The spread of nuclear weapons will be aggravated by this trade in nuclear materials, thus hindering efforts to control proliferation.

* They hasten the development of a 'Plutonium Economy' which threatens our democracy and civil liberties.

* The EDRP proposed for Dounreay concentrates a capital-intensive and uncertain investment in one place, so imbalancing the economy of the Highlands and prejudicing local economic initiatives. Less than one third of the construction jobs will go to local workers. The permanent workforce will not increase.

* The £200m invested in this project will endanger the market image of local industries, leading to job losses in fishing, farming and tourism. The proposed development will create fewer jobs than the same investment in other local investment options.

Send donations to:-
Dounreay Opposition Fund
c/o SCRAM
11 Forth Street
Edinburgh

Name. . . . . .

Address. . . . . .

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. . . . . Donation. . . . .

Accidents and Problems

Reprocessing Plants

1972 Nuclear Fuel Service West Valley Plant, USA. Closed down having achieved only 40% of its capacity due to technical problems. Costs and discharges were unacceptably high - 625t of spent fuel reprocessed.

1973 Windscale, UK. Residual radioactive granules burnt dry a process vessel in the B204 Head End Plant. When next batch of fuel was fed in, a violent reaction forced radioactivity into the plant contaminating 35 workers. BNFL admitted four years later that the plant was written off. It had only operated for four years and handled 100t of spent fuel.

1974 Mol, Belgium. A pilot plant could not be commercially feasible, so it was shut down. Only operated at 30% capacity. By attempting a process capable of handling various fuels, it generated more waste than a facility dedicated to one fuel type.

1981 Windscale, UK. An attempt to reprocess insufficiently-cooled fuel rods released Iodine 137. Milk was found to contain *2500 times* the normal level of contamination; BNFL pronounced it 'perfectly safe to drink'.

1983 Windscale, UK. Purex solvent and crud released into the Irish Sea. Greenpeace divers contaminated and 25 miles of beach closed off. BNFL was fined £10,000 for this accident.

Cap la Hague, France. Head End plant is operating at no more than 60% capacity.

Fast Reactors

1955 EBR 1, USA. Distortion of fuel assemblies caused a core melt-down and an explosion was barely avoided.

1966 Enrico Fermi, USA. A piece of metal blocked the coolant flow. If the core had exploded, containment would have been breached and up to 115,000 people could have been killed in the vicinity.

Super-Phenix, France. Reactor vessel and containment designed on basis of technical feasibility, not to withstand possible accidents. Super-Phenix fuel now loaded.

1973 BN 350, USSR. Sodium leak caused hydrogen fire but little else known.

1983 Rhapsodie, France. Sodium leak which led to permanent shutdown.

1984 Kalkar, West Germany. There was a sodium leak, but the reactor was not operating hence explosion in core was avoided.

Dounreay

1962 Dounreay Reactor had a blowback of radioactive dust which contaminated 4 men with large radioactive doses. One died 19 years later of cancer.

1966 Dounreay Reactor. A 'void swelling' caused distortion of fuel rods.

Fuel Rods lost. Date unknown, but the Department of Energy claimed that good grounds existed to indicate that the rods never left the site.

1974 PFR. Seaweed clogged fuel pipes for seawater cooling system.

1977. Sodium exploded in a waste silo.

1979. Contaminated flasks resulted in 4 men absorbing plutonium. The Dept of Energy criticised the UKAEA for failing to report the incident.

1984. 20 year old radioactive particles were discovered on beaches. These 'hot spots' were as bad as those near Windscale following the excessive October 1983 discharge by BNFL: Dounreay management claimed on December 1983 that the Windscale scare was not applicable to Dounreay, in contrast to the Scottish Office view that the existence of radioactive particles revealed a 'lack of control' on the part of Dounreay management.

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Greenpeace Ltd
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Tel: 01 251 3020

The Dunters
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Tel: 0856 83 463

Nuclear Reprocessing Concern Group
c/o Lynne Kropp, Avondale, Sartlet, Thrumster, Caithness.
Tel: 0955 3370

The Scottish Campaign to Resist the Atomic Menace was formed in 1975. **SCRAM** works with groups throughout Britain opposing every aspect of the nuclear chain from uranium mining to nuclear weapons. **Our aims are to inform the public about the hazards of the nuclear fuel chain; to oppose by non-violent means all further nuclear developments in Scotland and elsewhere; and to press for a long-term energy strategy based on energy conservation and the use of renewable energy sources.**

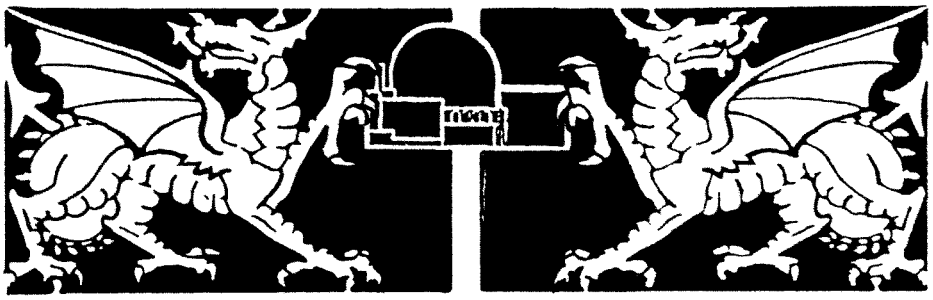
We publish the bi-monthly **SCRAM Journal** for the British anti-nuclear and safe energy movements. We run an extensive information service and have built up a large energy issues library. **SCRAM** has published several pamphlets and a book.

We are funded entirely by subscriptions to the **SCRAM Journal** and donations. So more than ever we depend on the practical and financial support of concerned individuals like you. **Please consider taking out a subscription to the SCRAM Journal or sending us a donation. Thanks!**

August 1985

Nuclear Leeks!

As an introduction to a series of articles on the Magnox nuclear power stations in Britain we are printing this article by Hugh Richards of WANA. This article looks at the record of the two Magnox stations in Wales and compares them with worldwide experience of Pressurised Water Reactors of the Westinghouse design (the type which was the subject of the recent Sizewell B public inquiry). In particular Hugh examines employment and economic investment policy in Wales and suggests a possible strategy for alleviating the problem of unemployment black spots.



The CEGB, and the Government, are committed to a programme of Westinghouse Pressurised Water Reactors (PWR's), and may build at least one in Gwynedd in Wales if the PWR at Sizewell gets the go-ahead. In choosing large Westinghouse Pressurised Water Reactors for Britain the CEGB appear to be continuing their custom of investing in proven failure.

It is extremely doubtful that the Welsh public, if they had a choice, would choose to buy a failed technology, that it doesn't need, from a country which has already abandoned it. It is well understood that the alternative investment in energy conservation, combined heat and power, and a modern coal industry would benefit Wales more than nuclear power. Nuclear Free Wales is not just a stand against weapons; 59% of the area of Wales is covered by counties that have passed resolutions against nuclear power.

Load Factors not achieved

There are two nuclear power stations in Wales, both of them Magnox stations, and both in Gwynedd, in North West Wales. It was always the intention of the Central Electricity Generating Board (and their predecessors) that these Magnox reactors would achieve a 'load factor' of 75% of the maximum possible output of electricity at the design rating from their scheduled start dates. The Welsh Anti-Nuclear Alliance (WANA) has taken a lock at how these investments have shaped up in practice. All the data comes from verifiable published sources: the Power Reactor Supplements of Nuclear Engineering International, and the Annual Reports of the Central Electricity Generating Board and their predecessors.

From the table it can be seen that Trawsfynydd, the first Magnox station in Gwynedd has failed to meet the expected 75% load factor by almost 11%. Wylfa, the last and the largest of the CEGB's Magnox stations, suffers from technical problems which have resulted in substantial 'downrating' and poor performance; its 41% load factor failing to meet the design 'target' by 34%.

The evidence submitted by WANA at the Sizewell 'B' Inquiry is summarised in the table. The actual output of *all* Westinghouse Pressurised Water Reactors worldwide was compared with the output expected by the investors at the the time they made the investment decision. Westinghouse PWR's have achieved a cumulative load factor of 28% up to 1984. Investors were told by Westinghouse to expect a load factor of 80%. Large Westinghouse PWR's (over 1100 MW), the size that are to be built in Britain, are even worse. Largely because of delays in construction they achieved a load factor of 9% up to 1984.

However such technicalities do not affect politicians in Gwynedd where local unemployment rates hover around 20%. They are lobbying for replacement nuclear power stations.

Sir Walter Marshall, chairman of the CEGB, attended a meeting at Trawsfynydd Nuclear Power STation in March at which he announced that replacing Trawsfynydd or Wylfa or both power stations with Pressurised Water Reactors were options that the CEGB would consider. He appears to have been drawn in, somewhat reluctantly, because of the CEGB's avowed strong desire to do something about an area of high unemployment.

The problem with both these Magnox stations it that they represent *concentrations* of employment in a sparsely populated rural area.

Expensive Job Protection

Any programme of job creation in Gwynedd to counteract the effect of closing these stations should avoid perpetuating this pattern by spreading employment opportunities more widely in the 'travel to work areas'. Gwynedd County Council and Meirionydd District Council have commissioned research from University of Wales, Bangor, into the socio-economic effects of closure. The CEGB have contributed about £5,000 to this research.

WANA applaud the concern about unemployment but question the wisdom of building further nuclear power stations. Building a PWR or an AGR at Trawsfynydd would cost at least £1.2 billion and provide about 600 jobs, roughly the number presently working at Trawsfynydd. In other words it will cost £2 million to maintain each job at Trawsfynydd. That would represent the most costly job-protection scheme in the history of the United Kingdom.

What British Steel have started doing about unemployment in former steel working communities the CEGB should don in Gwynedd, but the CEGB have no expertise in the field of industrial development. WANA are urging the CEGB to use Mid Wales Development as their agents in a £7 million job creation programme for the Porthmadog and Ffestiniog area. Trawsfynydd will not close for another ten years, so there is time to plan ahead, and finance the programme in stages. WANA acknowledge that this is not the only way in which new employment could be stimulated in Gwynedd, and that a robust strategy for employment should include the expansion of small, and medium sized businesses. All ways to combat the blight left by nuclear power stations should be considered fully.

	Trawsfynydd	Wylfa	Westinghouse PWR's Worldwide
Scheduled Output from Date of Regular Power Operation	10,250	18,290	605,490
Actual Output	6,605	7,503	172,128
Load Factor %	64.4	41.0	28.4

Nuclear power Stations in Gwynedd and Westinghouse PWR's Worldwide Performance up to 1/1/84 in MW Yrs (Gross)

NPT ~ No Peace Tomorrow

Concluding our series on the NPT Review Conference, Jos Gallacher makes practical suggestions which could save the Treaty from collapse. In particular he examines the possibility of a freeze in fissile material production - the cut-off.

Despite the obvious dissatisfaction of Non Nuclear Weapons States (NNWS), particularly the neutral and non-aligned group, with the lack of progress towards disarmament, the British Government has adopted a complacent attitude towards the 1985 NPT Review Conference. The official view is that Parties to the NPT have an interest in maintaining the Treaty unconnected with fulfilment of Articles IV and VI. British officials argue that the main benefit a country gains from the NPT is that other Parties will not build the Bomb. Thus, they claim, no-one will withdraw from the Treaty.

Complacency

Lord Trefgarne, junior defence minister, expressed this view recently: 'Countries which might contemplate acquiring nuclear weapons are influenced primarily by their perceived security needs, based on their own regional concerns'. (1)

For a number of reasons this complacency is misplaced. Firstly, for many NPT signatories the main regional threat comes from a non-signatory which already has the capacity to produce nuclear weapons: for the black countries of southern Africa, security concerns are focussed on the presence of South Africa which has not signed, has the technological capability to build the Bomb and is widely suspected of having conducted a test explosion in 1979; similarly, to the Arab states of the Middle East, Israel appears as the major threat to security, remains outside the NPT and has repeatedly hinted over the last ten years that it has the Bomb.

When fears about South Africa and Israel were raised at the 1980 Review Conference British officials dismissed them as extraneous political issues.

Secondly, some states may feel themselves threatened by countries which the NPT permits nuclear weapons. India's refusal to sign reflects its fear of China's nuclear arsenal. Conflict between a Nuclear Weapons State and a NNWS in the Falkland's War has inhibited non-proliferation efforts in South America. Since most countries do view their security in regional terms, if one state renounces the Treaty or opts for the Bomb its neighbours are likely to follow.

Thirdly, many states do not have rivals or near neighbours with the capacity to produce nuclear weapons. For them the NPT has no security penalty and they may choose the dramatic gesture of rejecting a Treaty which embodies privileges for the rich and powerful NWS. Jamaica and Nigeria are two countries in this position who have signalled at the United Nations that they are considering this course of action.

Finally, since the NPT expires in 1995 unless a conference decides to prolong it, policy makers should be looking beyond surviving the 1985 Review Conference and towards establishing a lasting regime.

The survival of the NPT requires serious efforts to implement Article VI - the minimum requirement is a Comprehensive Test Ban (CTB). A CTB Treaty would balance the discrimination of the NPT by imposing the major burden on the NWS and by impeding the proliferation of nuclear arms in existing weapons states.

Another complementary measure would be a freeze on the production of fissile material, as has been suggested by SIPRI (Stockholm International Peace Research Institute) in their 'Safeguarding the Atom' report earlier this year. A 'fissile cut-off' would set an overall limit on the multiplication of nuclear weapons. (The US currently produces 1-2 tonnes of weapons plutonium per year.)

Cut-off

A cut-off would remove another discriminatory aspect of the NPT. NNWS have consistently complained that the NPT imposes safeguards on them and not on NWS. The cut-off would be verified by the same safeguards as the NPT, but the weaknesses that inflict NPT safeguards need not prove fatal for the cut-off because although they may fail to detect the diversion of a few kilogrammes each year, the addition of one or two warheads to stockpiles already numbering tens of thousands is insignificant. Previous attempts at a cut-off agreement foundered on the Soviet Union's refusal to accept the on-site safeguards required. However, in 1982 Andrei Gromyko spoke in favour of a cut-off at the UN Special Session on Disarmament and he added, 'The Soviet Union is agreeable to placing under the control of the International Atomic Energy Agency a part of its peaceful nuclear installations - atomic power plants and research reactors.'

A safeguards agreement has now been reached between the IAEA and the Soviet Union and will be ostentatiously ratified immediately before the NPT Review Conference opens. For the first time a cut-off agreement becomes politically achievable.

The Soviet offer puts them in the same position as Britain and the US who have voluntarily accepted limited safeguards in order to meet criticisms that the NPT might confer a commercial advantage on NWS who need not bother with safeguards.

A major problem for the cut-off would be the production of fissile material for peaceful use. The simplest solution would be to ban all fissile material production. The US was persuaded in the 1970's by the economic uncertainties and proliferation danger to abandon reprocessing. Today only Britain and France operate commercial reprocessing plants. Germany, Japan and Belgium have plans to begin commercial operations while many other countries are developing the technology.

Dounreay

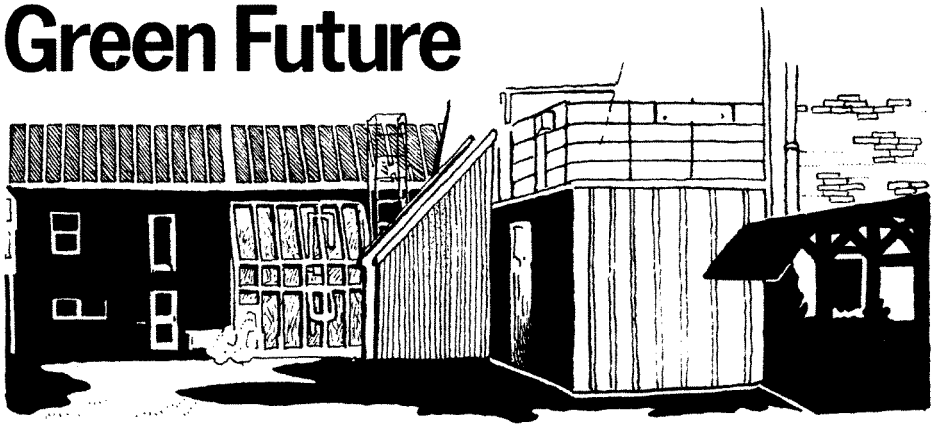
US advocates of the cut-off have calculated that if planned expansion goes ahead, over 300 tonnes of plutonium will be separated before the end of the century while no more than 100 tonnes could be used in fast reactors. (2) The 200 tonne excess could undermine the cut-off. The cut-off idea can link opposition to the expansion at Windscale and Dounreay to the demand for superpower disarmament.

Britain is proud of the role it played in negotiating the NPT. If it wishes to save the Treaty from collapse it could now play a role in bringing together the superpowers in talks on the CTBT and the fissile material cut-off. The need is clear, only the political will must be found.

1 Letter from Lord Trefgarne to Mrs E Kellet-Bowan MP in response to points raised by the author.

2 Cutting-Off Nuclear Weapons Production at Source. *F A S Public Interest Report.* Vol 38, no 2, Feb 1985.

Green Town ~ Green Future



Late last autumn, as reported in SCRAM 47, Milton Keynes Development Corporation (MKDC) issued a formal Planning Brief to the Greentown Group. Greentown, with its long-standing objectives of a co-operatively run, mixed-use village community, would represent a major step forward for the 'Green' movement. In this article David Olivier describes the key features of the project, especially the energy-related ones, and summarises the state of our negotiations with the planning authorities.

The basic principles of Greentown include community land ownership, to prevent speculation, the ability of the residents themselves to plan and develop the village, and for all decisions affecting the community to be made democratically. It is a premise of the Group that all members have ideas to contribute to the design of the village, and that the built environment can only benefit by incorporating the best ideas of all, agreed by all.

The Group has formed Crownhill Village Association Ltd (CVA) to develop the 15 ha of land offered by MKDC. CVA will purchase the land in stages, in turn making land available on long leases to Self-Build Housing Associations, Housing Co-operatives building for rent, or other groups. All adult members of the village will have one share and it is intended that even people with negligible capital will be able to live there.

The basic planning principle is phased organic growth, with village residents deciding the location of specific public buildings, housing clusters, footpaths etc, on site as the need arises. The basic form of the village will follow generally-agreed 'patterns', many of which are set out in the book by C Alexander et al, *A Pattern Language*, and its companion volumes. They are the basic rules which, until quite modern times, governed the basic design of buildings, outdoor spaces, etc, and helped create some of the richest and most beautiful surroundings in which to live.

The 'Green Car' Concept

Naturally, Greentown will be designed and run on environmentally sound lines. Buildings will be very well insulated and well sealed, often to Scandanavian/North American standards; i.e., 200-300mm mineral wool or equivalent, much better than UK practice. In moderately cold climates, such buildings sometimes stay warm and comfortable just on internal gains from people, etc, plus solar gains through the windows. A community reuse and recycling system is planned for domestic refuse. Eventually, the village aims to treat its own sewage (with methane as a byproduct) and generate most of its energy (except perhaps transport fuels) from renewable sources, such as solar, wind and biomass.

The 'Green Car' concept is likely to be applied in Greentown for the first time at the community level. The cars, owned collectively by groups of households, will be paid on a metered 'pay-as-you-drive' basis. By making the high cost of motoring more obvious, it is hoped that this form of car ownership will discourage cars being used where walking, bikes, trains or buses are more appropriate.

EEC support of up to £215,000 was recently confirmed for a renewable energy demonstration project in the first dwelling cluster; see below. Matching funds are hoped for from the UK government. It would involve a combined photovoltaic/wind electricity generation system, the equipment being manufactured by UK companies who wish to demonstrate its use in an industrial country before comparable projects in the third world.

The first three housing clusters are already at an early design stage, although the Group welcomes new members at any time. The first dwelling cluster is likely to comprise three terraces, each of 4-6 houses, plus a collective dwelling with a laundry, workshop, library, food processing equipment and storage space, and a dining room for group meals. Built to the same energy efficiency standards as the pioneering 'superinsulated' houses of Scandanavia and North America, which now number 30-40,000, the houses should likewise stay warm and comfortable on trivial amounts of space heating energy. The cluster obtained money from the RIBA's 'community architecture' fund; this is helping to fund design work by NCD, a York architectural co-op.

As a community mainly of self-built housing, but including many low income residents, Greentown offers one of the few ways, at least in the south-eastern half of England, for such people to gain access to owner-built housing. Although Greentown seems unique in a UK context, MKDC has come under political pressure in recent years just to sell land at the highest possible prices - i.e. to the Wimpeys and Barratts of this world. It has tended to treat us like any other speculative development, resulting in growing difficulties for the Group.

We believe that MKDC will have to change its recent policy of treating us as 'any other developer'. Although MKDC claims reluctance to sell land at below market value, we have pointed out that it has an obligation to provide housing for lower-income people. Currently, it is trying to meet this need by shared ownership schemes, which themselves are very heavily subsidised. Greentown could actually avoid substantial subsidies!

Phased Organic Growth

Also, Greentownn differs radically in many ways from a normal speculative development. First, public/commercial buildings, horticultural land, woodland, recreational and children's play areas, etc, would form an integral part of the village. Apart from the buildings, such areas would consist of green, non-residential land *in perpetuity*. There is the planning principle of phased organic growth, which is the way that most communities in the past developed. Finally, secrecy in the planning process, which MKDC seems to support, conflicts with the need for a constant flow of information from the Greentown Group's active workers to its other members, as well as the Group's need to attract new members. In no other way can key decisions be made as democratically as possible.

By around 1990, much of Greentown could be complete. 500 people, some 180 dwellings, public buildings, children's playspaces, workships, public open space, woodland, gardens and orchards would occupy the 15ha Crownhill site, on the western edge of Milton Keynes. For the village to reach fruition, we now need a sympathetic attitude to our proposals from the planning authorities.

For further information please contact: Greentown Group, 109 Church Street, Wolverton, Milton Keynes, Bucks, England, MK12 5LD. Tel: (0908) 317892.

Wave Energy

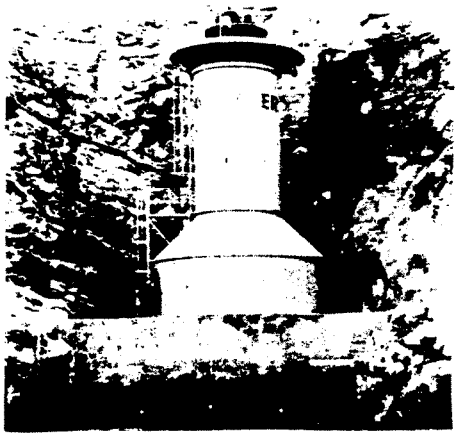
The Government formally announced the death of wave energy at question time on July 2. There was not even a whimper from the Opposition Front Bench which is suprising as they are quite good at whimpers. And this was one of the more inspiring programmes which was introduced by the Labour Government - Tony Benn was Energy Secretary and the scheme was launched by his Chief Scientist, one Dr Walter Marshall, since ennobled.

The event was accompanied by the issue of a handsome volume, Wave Energy (HMSO, £8), which gives the customary high standard of technical information and illustration, but seeks to argue that the reason for abandoning the technology in which Britain had a lead over all other countries was that the electricity it would produce would be too expensive. There was 'a low probability' of generating electricity for less than 8p a unit in 1982 money values. This is plainly a non-starter when the CEGB can produce a unit of electricity from burning coal for just over 4p and it claims that its nuclear power is still cheaper.

Cheaper than Coal

So there is no further argument? In fact, there is one little problem still to be encountered. In October Norway is to launch (if that is the right word) the world's first full-scale wave power station on the shore of an island near Bergen. It is a hollow chimney, 60 feet high, with an air turbine at the top. As the waves dance up and down, a bubble of air is pushed up and then sucked back in, driving the turbine in the slipstream from the 'free' fuel provided by the sea. And the cost of a unit of electricity from that device, according to a British survey, will be only 3.4p a unit, considerably less than coal.

The British survey was actually paid for by the Energy Technology Support Unit which oversees the British renewables programme from its headquarters in Harwell. It paid to send one of our wave energy scientists, Dr Peter White from Lanchester (Coventry) Polytechnic to report on the Norwegian project and when he brought back his cost-estimate Harwell promptly declared it to be 'commercially sensitive' and refused to release it. The Norwegians, whose commercial secrets it was supposed to contain, then gave a copy of it to me for publication here. Harwell then reluctantly declassified it.



The report uses conservative standards to calculate the costs. The unit has been financed 50% by the Norwegian Department of Energy and 50% by a company called Kvaerner, one of the world's leading manufacturers of water turbines for hydro-electric plant, which has a commercial instinct for the market place available to units like this one. It has a capacity of 500 kilowatts (and this may prove to be an understatement by the Norwegians) and cost about £500,000. ETSU has tried to cover its embarrassment by inserting a paragraph in another document just issued, 'Prospects for the Exploitation of the Renewable Energy Technologies in the UK' (HMSO, £7). It says that Norway's low cost-estimate depends 'on special geographical location which will not in general be applicable to UK conditions' - meaning that Norway is standing it on a cliff-face in deep water and there are not many such sites. The Norwegians would have told ETSU, if they had been asked, that the cost of mooring their 'chimney' at sea, and the cost of gouging a space in the cliff-face, are not going to be much different.

Whatever ETSU may say, Norway will find herself world markets for a device which will produce electricity from a 'fuel' which comes free and which generates in a way that does not pollute, is not subject to distant events such as political and market upheavals, and will last forever. The Department of Energy will now be able to produce as many glossy brochures as it pleases but the fact of Norwegian wave energy will not go away and the Government will not find it easy to explain why we threw away a lead which had been acquired when we were pioneers in this field, spent £15 million over nine years and then decided to pull back.

'Nuclear Expansion Justified'

One reason was inadvertently disclosed by the CEGB. When it embarked on research into renewables in 1978, a secret internal memo said: 'It is important to explore these alternatives in order both to *satisfy* (my italics) ourselves that nuclear expansion is fully justified and to demonstrate this to others, since groups opposing nuclear expansion have made substantial progress in the past few years.' So, for at least one participant, the research was a spoiling exercise. Wave energy was, of all the renewables, the one which most seriously challenged the nuclear programme because of the size of the resource. It could also prove eloquent in the forthcoming inquiry into a nuclear reprocessing plant at Dounreay which could be a shore base for wave energy, providing thousands of jobs as an alternative to another Windscale.

David Ross

Efficiency

A report by the Policy Studies Institute on energy efficiency in UK houses has thrown up some interesting facts: -

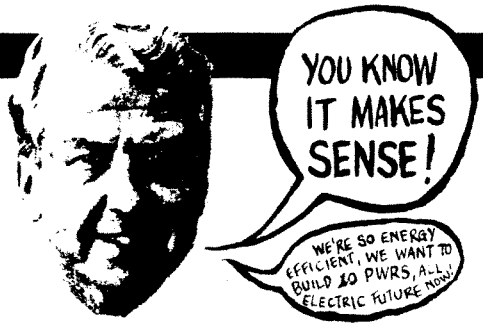
*Only 15% of British houses have windows and doors draught proofed.

*Only 10% have insulated cavity walls.

50% have adequate roof insulation and one in four have double glazing.

*To rectify this would create £150,000 jobs, saving £6bn a year in energy costs.

Praise was given to Peter Walker, Energy Secretary, for his proposed energy efficiency year in 1986. However he was also criticised: - "Reliance on market prices, combined with advice, exhortation and some small financial support are insufficient. What is lacking is the commitment to removing financial and institutional barriers.'



Savings in energy must affect future investment in energy supply. The International Energy Agency's annual review criticises the UK's vague energy policy.

ACE, the Association for Conservation of Energy, suggest comparing savings and investment in energy conservation with that of energy supply and argue: 'it is patently absurd that we have totally different criteria for investment in new energy supplies, as opposed to decisions taken by, say, the health service to invest in energy saving measures which will reduce costs.'

However, we can all look forward to the Sizewell PWR decision next Xmas, starting off the energy efficiency year with a big bang.

Financial Times 13.7.85
H & V News - July 13th 1985
BSEE - July 85

The government has confirmed its commitment to renewable energy by making a cut in the budget look like an 'upward trend of support'.

Mr David Hunt, minister responsible for renewables, announced a programme of concentrating research on 'promising options' governed by economic attractiveness, in response to a report by the government Advisory Council on Research and Development reviewing Britain's efforts on renewable energy.

It is hoped there will be a market for wind energy to serve remote communities in the UK. The council recommended continuing support for wind, bio fuels, (farm, industrial and domestic waste as fuel) and geothermal energy, but urged rejection of wave power as a viable source.

In their economic juggling the 'gamble' is to 'back the winners' therefore from the £1 bn a year energy research budget renewables are to receive an increase of no more than the present £14m a year. David Hunt tells us that £68m will have been sent from 1980-1985 compared to £16m between 1975 and 1980, he forgot to mention that the budget in 1981-82 was more than the pittance committed this year.

Financial Times 3.7.85

Solar

The Solar 2000 system can produce hot water for space heating regardless of cloud cover. The 2000 system is based on a high vacuum tube consisting of a series of 176mm glass tubes arranged in rows. Each tube is covered with a coat of black cobalt which can absorb a large proportion of heat from the sun even when it is cloudy, making it three times more efficient than conventional flat place collectors. The developers, Energy Saving Consultants Ltd, claim that the system can pay for itself over a four year period.

Energy Manager June '85

Acid Rain

Much has been written about the effects of acid rain on trees, waterways and buildings, but little coverage has been given to health effects. The Summer '85 issue of Acid News, published by the Swedish and Norwegian NGO Secretariats on Acid Rain, gives its front page over to the threat to children's health.

The newsletter prints a personal account of what it felt like in Essen in January this year during the state of emergency called because of smog. The report reads: 'For days on end we have been living under a lid of smog. Everything appears in shades of grey, and sight is limited to 50 metres at the most. Persons with poor circulation and those suffering from bronchial trouble have been warned over the radio not to go out. Children were preferably to be kept home,and in most of the Ruhr cities the schools have been closed.

'At such a time we are especially anxious for our children. Every little cough is worrying, nursery doors are kept open, windows shut tight. The cause of our worry is pseudo-croup.'

Pseudo-croup is characterised by inflammation and swelling of the larynx with consequent acute breathing difficulties accompanied by a spasmodic ringing cough. In extreme cases affecting infants and young children, the relatively rapid swelling of the larynx may result in death through suffocation. It usually occurs at night and is especially noticeable at times of above-average air pollution although it may be caused initially by a virus.

RENEWABLES - THE POTENTIAL

	Status	Economics	Possible energy output in 2025 (m tonnes coal equiv.)
Electricity-producing:			
Wavepower	Long-shot	9-15p per kwHr	Nil
Wind - onshore	Promising	2.5-2.3 per kwHr	1.6
Wind - offshore	Long-shot	4.7p per kwHr	Nil
Tidal power	Promising	3.7p per kwHr	Nil
Tidal power	Promising	3-7p per kwHr	No estimate
Hot rocks	Promising	3-6p per kwHr	No estimate
Photovoltaics	Long-shot	4.16p per kwHr	0.04
Heat/fuel producing			
Geothermal	Promising	***	0.25
Passive solar	Attractive	*****	2
Dry waste biofuel	Attractive	*****	8
Wet waste biofuel	Mixed	Mixed	1.6
Energy forests biofuel	Promising	****	14

*****indicate level of economic attractiveness.

'Turning on the Heat' GLC Popular Planning Unit. (Free)

This Information Pack, like everything I've seen from the GLC, is well produced, easy to read, and I'm sure it will prove to be a valuable resource for tenants, pensioners, advice centres and anybody campaigning on energy and heating problems. It is made up of 8 broadsheets, the first of which puts national energy policy into context. It explains why fuel prices have been going up - electricity 80% and gas 100% since 1979. The nuclear lobby is seen as a powerful alliance between the electricity boards and private companies who make huge profits at the expense of the electricity consumer and the taxpayer. An alternative energy strategy for London is outlined, based on Combined Heat and Power and energy conservation.

The second broadsheet explains how to develop local energy plans, and some of the things which the GLC and Borough's have initiated in London. With the help of the GLC funded 'London Energy and Employment Network' many tenants are putting pressure on their Borough Council to update inefficient district heating systems. One of the most interesting developments is the establishment of the Tenants Heating and Insulation Service (THIS). THIS aims to help council tenants whose local authority cannot afford in the foreseeable future to install adequate heating and insulation measures in their dwellings. They will install heating and/or insulation measures by using a low interest long-term loan. Tenants weekly repayments, plus their fuel bills, will often still work out cheaper than their previous fuel bills.

Sheet 3 explains how tenants can carry out surveys and gather background information to support their case for better heating systems and insulation, while the fourth explains how to claim additional heating benefits from the DHSS.

One of the most common things you hear from a local authority is that there isn't enough money for improvements to the heating system or insulation. The fifth sheet explains local authority finance and how some councils are using more imaginative approaches to help pay for energy conservation. The following sheet looks at standards of insulation, and how these standards affect the cost of heating.

The penultimate sheet encourages tenants to get organised, and explains how to set up a group and how to lobby councils, and gives some examples of actions which have been successful. The final sheet gives a list of useful contacts.

It's wonderful to see a council as large and influential as the GLC producing a pack like this. The idea that energy is too important an issue to be left to a handful of bureaucrats and multinational companies is obviously growing. Hopefully after more people have read this, more people will realise that the nuclear lobby is actually preventing millions of people achieving a decent standard of heating and insulation for their homes.

Organisations campaigning on energy can get their free copy from Peta Sissons, Popular Planning Unit, GLC, The Showroom, South Block, County Hall, London SE1 (max 10 copies per group).

Pete Roche

The Development of Atomic Energy 1939-1984 by UKAEA. 2nd Edition. £5.

Mainly a chronology laid out under three headings - **Atomic-International, Atomic-British** and **General. General** covers world events, with the intention of providing a backdrop for the nuclear story.

The backdrop often obscures rather than illuminates. The Vietnam War is extensively covered, but only as US troop movements and conferences. The *casus belli*, though not so identified, appears thus:- 'US destroyer attacked off North Vietnam, US aircraft attack N. Vietnamese bases in reprisal', not the version appearing in the Pentagon Papers. The formation of the EEC and Nato are mentioned, as is the appearance of Comecon, but strangely the Warsaw Pact is not. The appropriate date is 1955, 6 years after Nato. Other omissions include the death of Allende, the Greek Civil War, the Sino Soviet rift, Greenham Common and the US invasion of Cuba and the Cuban missile crisis.

The opposition are mentioned, but not frequently:- no mention of any Torness demos, the recent spate of large CND demos rates one mention - 'Large demonstrations in London, Rome, Bonn, and Brussels against Cruise and Pershing missiles.' The first wave generation CND and related groups are given 13 entries, but the new larger dynamic version rates only 2.

On the nuclear side only two reactor accidents are mentioned:- Three Mile Island and Windscale 1957. Favourites like Brownsferry, Malville and Hunterston (leak 1977) are omitted, whilst the eleventh General Congress of the IAEA (Vienna 1967), and the other eighteen appear, though with no indication of their worth or purpose.

The entries are generally too short. The Baruch Plan (1946) is recorded but no clue to its purpose is given. Likewise the KEMENY report. In 1980 the world's largest nuclear plant, in the USSR, became operational, but we are not told its size, the launch of the nuclear powered vessel the *Otto Hahn* appears, but not its subsequent demise. However, if you require dates of acts of parliament and inaugurations, the book is great.

On the inside back page a list of UK nuclear power plants with commissioning date and capacity appears, but all is not as it seems. The size of Magnox reactors appears under the heading Net Capability whilst the title used for AGRs is Nominal Capacity. This is important because the maximum output of AGRs is often less than the usual Nominal Capacity. For Hunterston B the numbers are 1040 and 1320 MW.

This UKAEA publication does contain useful information, but a chronology alone does not allow ready access. Should you wish to know when the SGHWR came on stream, you have to guess the date and search outwards. The inclusion of an alphabetical index would be a very useful addition. The book is valuable should you wish to ascertain the important events over a few years, though you rely on the UKAEA's idiosyncratic selection. The crunch is - would SCRAM buy a copy? (We were leant, rather than given a review copy.) Probably not, though a donation would be appreciated.

Jeremy Adler

The Atom and the Fault by Richard L Meehan. (MIT Press, £15.50, 191pp)

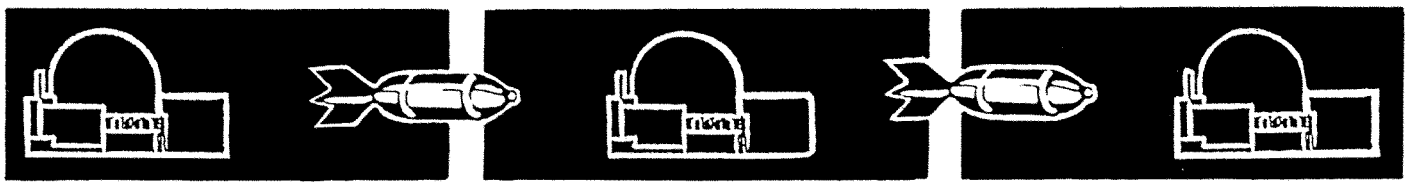
This is not a book concerned with the risk of nuclear accidents arising from catastrophic earth movements; in fact, despite its sub-title 'Experts, Earthquakes and Nuclear Power' it is not about earthquakes at all. Rather, and to be fair to the author who makes no other claims, it uses the concern expressed in the United States over risks to nuclear plants arising from violent earth movements along nearby faults to propound the author's thesis on the philosophy of decision taking for high potential risk projects in general.

The author, an engineers, discusses a number of case studies from the 1960's and 1970's where dangers from geological faults were crucial factors in assessing the acceptability of nuclear plants. He presents the background to each case concisely, and to me these case studies were the most interesting part of the book. However, the examination of the decision making process in each case is rather confusing for a British reader unfamiliar with the American planning and plant licensing systems, and it is difficult, for example, to assess how the tactics of the parties involved compared with the situation in this country.

The prime purpose of the book, however, is the author's critique of the decision-making process. He argues that judgements by 'experts' are generally no more objective than those made with an overt vested interest and suggests that there is scope for analysis of the philosophy of decision-taking - i.e. the adversarial decision-taking process is the consequence of a society with no consensus over its aims and objectives and cannot be improved until those involved, including 'experts' have a clearer understanding of their own values.

This is hardly an original proposition. Frankly, this book has all the appearance of having been written for an American undergraduate course in 'Science and Society'. As such, it may have its place in sowing doubts in the crystallizing minds of nuclear engineering majors at Massachussetts Institute of Technology, but I am doubtful if it has anything to say to a British readership, especially one which is unlikely to find anything fresh in the debunking of the myth of the objectivity of scientific opinion.

Michael Leven



Non-Proliferation: the Why and the Wherefore ed. Jozef Goldblat (Sipri, £23, 343pp), Nuclear Proliferation Today by Leonard S Spector (Vintage, 478pp, £4.50)

Countries asked why they have not signed the Non-Proliferation Treaty can come up with a good sound justification - that in spite of the undertaking by nuclear armed powers to cease the arms race, they carry on regardless. That, however, is not the true grievance against a treaty which cannot referee Cold War games. The real complaint is that those who did sign the treaty don't get a better deal for civil nuclear supplies than those who did not. This is indicated in Jozef Goldblat's chapter which examines each article of the Treaty and how it has been followed in practice.

The countries then answer 'why?' thus:

China: (before possessing nuclear weapons) A monopoly is a bad thing. Imperialist nuclear weapons bad, socialist nuclear weapons good.

China: (now possessing weapons) Proliferation is bad. Outside inspection of nuclear facilities is bad.

France: Post-empire blues and military humiliation in Indo-China and Suez means we must have weapons to get a seat at the disarmament talks.

Argentina: It's unfair to ban peaceful nuclear explosions. Not that we've found a need for them.

A lot of the motivation is just in case - Brazil wants the nuclear option just in case Argentina has it, Pakistan stocks up on Beecham's when India sneezes. Also Pakistan, and South Africa, find hovering on the threshold can mean being bribed with military supplies from the US as a pay off not to step right through the door. Potential nuclear weapons give them more political and economic dividends than actual weapons ever would.

This book also includes useful appendices for reference, e.g. the text of the Non-Proliferation Treaty, tables of the nuclear facilities of each country written about, and the Treaty of Tlatelolco.

Nuclear Proliferation Today explains the how of getting nuclear weapons. If you want the technology you may, say, try and buy it from Japan who will then breathe down your nuclear installations; other, more lenient countries, may have the US pressurising them for safeguards. But you may be able to shop around, getting valves from a Swiss firm, a centrifuge regulator from a British firm; you may be able to buy covertly some things on the 'trigger list' of nuclear supplies, and smuggle them in. You may even find that if you have not signed one of the non-proliferation treaties that you can sell your signature for more nuclear materials.

It's hard to draw general conclusions from this book which is packed with deals made by this and that country and company, many of the details having to be guessed. Spector pins his hopes on the suppliers, who have shown some willingness to work together in keeping buyers tied to the International Atomic Energy Agency, some diplomacy to this limited end, in contrast to the posturing and hysteria of Cold War disarmament talks. The sense is of Western countries waking up rather late to what their merchandise of enrichment plants, reactors and heavy water may be used for. A government may not be actively seeking to make bombs immediately, but when the nest is prepared, it may be hard for it to hold on to its eggs.

R M Bell

Little Black Rabbit's ears twitched recently when on a trip to Lancaster. Could it be that things have not been going according to plan? It appears that the 'fail-safe' system has been tripping the reactor in Heysham 1 before it reaches full power, and the cause could not be identified. A novel solution was arrived at - the threshold of the safety system was raised thereby eliminating the problem!

Little Black Rabbit, who knows a thing or two about these sorts of things, thought this sounded quite serious. The question arose - how to verify this rumour? The obvious place to look seemed to be the minutes of the Heysham Joint Consultative Committee.

Sure enough a discussion of the tripping out problem had taken place. However, there was no detailed note of the discussion, only a reference to it. Mr Matthews of the CEGB explained that, 'shutdown systems were intrinsically designed to be fail-safe. Heysham 1 was looking at a system of making them more efficient and reliable.' He explained that it was a question of getting the component reliability right but that there would be no interference with the basic fail-safe philosophy.

So now we know!

Little Black Rabbit.

DEAR SUPPORTER

We would like to take this opportunity to thank all our subscribers and regular readers for the support we've been given over the years. We hope you agree that the quality of the **Journal** has improved. With your support, supplying us with copy, criticism and cash; we strive to keep up the standard we've set.

With the appointment of our second paid worker we will be able to produce the **Journal** more efficiently and keep up the office administration. **BUT WE NEED MORE MONEY FOR WAGES.** Our present wages pool is not deep enough and the tap is filling it slower than the it is emptying through the plughole. The occasional bucket thrown in helps, but with two wages to pay we really need another tap!

We therefore appeal for more money. If you can afford a regular donation please fill out the standing order form below - we need at least another £200 per month - help us turn on another tap. Alternatively, please send us a one-off donation 'bucket' - every little helps.

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CAAT

Campaign Against the Arms Trade

National Meeting

This September, the CAAT supporters National Meeting will focus on:

-who finances the arms trade;

-peace and Third World development.

The meeting will be held at the St Mary's Centre in Middlesborough over the weekend of 28/29th Sept. All who are interested in campaigning against the arms trade are welcome to come.

Contact: CAAT, 5 Caledonian Road, London N1 9DX. Tel 01 278 1976.

International Energy Efficiency Conference '85

18/20th Sept at the Brighton Metropole Hotel, Brighton, Sussex.

Topics include: Lighting, Auditing & Monitoring, CHP, Energy Management & Control Systems and Insulation.

Contact: Eric Gosden/Bob Stanton, Industrial Trade Fairs Ltd, Radcliffe House, Blenheim Court, Solihull, West Midlands.

TCPA

Town & Country Planning Association

1985 Forthcoming Events

29th Sept/5th Oct - Energy Planning Tour of Sweden.

15/16th Oct - Energy Conference, in Bristol.

1/3rd Nov - Weekened School for Councillors on Development Control, in York.

4/5th Dec - Annual Conference: New Forms of Urban Government, in Swansea.

Contact: Sally Scarlett, TCPA, 17 Carlton House Terrace, London SW1Y 5AS. Tel 01 930 8903.

EfP

Electronics for Peace

The EfP network was set up to meet the challenge of the ever increasing complexity of military equipment and the role of designers and engineers in combatting it. EfP's aims include:

*supporting electronic engineers who are concerned for the military implications of their work,

*providing technical information to those working in the disarmament field,

*promoting an awareness of military electronics among the public,

*encouraging development of socially appropriate applications of electronics.

Contact: EfP, Townsend House, Green Lane, Marshfield, Chippenham, Wilts.

BANG

Beckenham Anti-Nuclear Group

have produced a cassette tape. One side has three clear expository talks - 'About nuclear energy', 'Sources and Resources', and 'Cargo of Dread'. The other side has eight anti-nuclear songs performed by Peggy Seeger and Ewan McColl.

Available for £2 from Beckenham Anti-Nuclear Group, 35 Stanley Avenue, Beckenham, Kent BR3 2PU, England.

BACKGROUND RADIATION - ANNOUNCING

sphere discharged up a stack - without filter. Oxygen and moisture are thus introduced - with, in addition, (given the location of British nuclear plants) the possibility of sea-spray. This is the Windscale No 1 formula and is absolutely unacceptable since the 1957 fire. The text at this point, in what is otherwise a well-considered document, is at its weakest: here once more are the bland reassurances, the disastrous arrogance. 'Any activity release from a leaking container would in any event be extremely small.' in any event? They open their mouths too wide. And again: 'Adequate time is available to locate and remove the container responsible for the release' which - as may be; the head end provides facilities for this, but by the time they come into operation the leakage has gone up the stack anyway.

Opposition Should Continue

How anybody, after the Windscale fire, could possibly write 'there is no need for permanent filters to be fitted in the stack' is almost beyond belief, but there could be another reason for their omission: filters could interfere with the airflow which is by convection i.e. not forced.

Furthermore the introduction of air as coolant has introduced design problems other than potential corrosion. It is necessary to maintain a maximum temperature within the store of 200° C, that being the temperature at which uranium oxide fuel undergoes further oxidation - *if oxygen is present.*

One scratches one's head: why did they not got the whole hog and do the thing properly? If you do not want the risk of oxidation then you eliminate air (not to mention the attendant moisture and possible salt) and you substitute carbon dioxide which is a far better heat conductor. Under these circumstances the limiting temperature is not 200° but 400° C, which provides more latitude and better convection. Nor is a stack filter necessary; what is needed is a closed recirculating loop, entirely sealed off from the atmosphere using an air or water cooled heat-pipe cooler - this is actually envisaged in the text, which I am here quoting almost verbatim! A final refinement which would aid heat transference would be to use helium rather than argon as the gas filling in the containers because it has far better thermal conductivity.

Our position is clear and scientifically defensible; we will continue to oppose any development in nuclear waste management which permits any possible return of radioactivit to the environment no matter how improbable the circumstances. If this NNC development had incorporated a closed circuit cooling system we would have had little grounds for objection. But the industry never learns. It will shell out huge sums to PR firms to brainwash the public; other sums go to remote professors with no campaign experience who illuminate our strange attitudes by means of questionnaires; yet when something stares them smack in the face they do not see it. Perhaps if we sent in a bill for £250,000 they would listen: but in this instance as in others, if they do not listen they will most certainly learn through our opposition - which will no doubt surprise and pain them as much as ever.

However: with this development, dry storage is out in the open as a campaign issue, and here to stay. It is useful to conclude with a summary of the reasons why it was inevitable. They are:-

a) Mounting backlogs in storage ponds due to reprocessing bottlenecks at the Industry's No 1 rogue elephant, BNFL Windscale;

b) Uranium gluts combined with higher burnup times in reactors make a 'once through' policy increasingly attractive;

c) No civil need to reprocess unless or until the Commercial Fast Reactor is proved;

d) A glut of plutonium in the weapons programme. (See Mrs Thatcher, *Atom*, May '85 p37);

e) The fact that the longer it can delayed, the cheaper reprocessing becomes, because it is radiologically safer;

f) Perhaps most important: doubts about the oxide reprocessing plant, THORP. Its original cost was around £1000 million. BNFL give it a life of 10 years; and it takes 10 years to build. So as soon as you complete on you start building the next. The nuclear world may be far from sane - but nevertheless this may be a bit much for it to stomach.

Don Arnott

[redacted]

We must again apologise for gremlins getting into the typesetting during the last Journal. There were three errors in 'Background Radiation' on pages 6 and 7 which gave a different impression to what the author, Don Arnott, had intended.

The bottom of column one on page 7 should have read: 'there is no forecasting anything about the ultimate consequences except that they are unlikely to be *pleasant for us. I have always believed that the long-term detriment* to be suffered by Mankind as the prices of its nuclear activities. . .' The words in italics were omitted.

The last sentence of the first paragraph on column 2, page 7 should have read: 'And there is no technical reason which could justify it.', not 'And there is not technical reason which could justify it.'

The first sentence of the second paragraph of column 2, page 7, should have read: 'The Flowers Report in one of its rare lapses of intellectual rigour. . .', and not '. . .in one of its rare lapses into intellectual rigour.'

We are very sorry, Don.

Railhead Goes Ahead

'The planning authority. . . misdirected themselves as to the proper purpose and remit of the inquiry'. So suggests George Maycock in his Report to the Secretary of State for Scotland following the public inquiry into the railhead proposed for the Torness nuclear power station. Steve Martin studied the Reporter's recommendations and the Secretary of State's decision and puts them in the context of the forthcoming public inquiry into the Dounreay expansion.

The decision on the Torness railhead application was handed down by George Younger, the Secretary of State for Scotland, at the end of July, following the public inquiry held last October. The result of Mr Younger's deliberations was marked by a flourish of non-publicity; the Press were left to learn of the decision from East Lothian District Council.

The format of the inquiry directly concerns those opponents of the joint application by the UK Atomic Energy Authority and British Nuclear Fuels for outline planning permission to construct a fast reactor fuel reprocessing plant at Dounreay on the north coast of Scotland. We can expect the same tactics being used by the Scottish Office in an attempt to prohibit examination of issues raised; namely energy policy, international regulations on transport and discharges, nuclear weapons proliferation and the economics of fast reactor reprocessing.

From the outset the railhead inquiry