The Anti Nuclear & Safe Energy Journal

SCRAM

NUCLEAR POWER? NO THANKS

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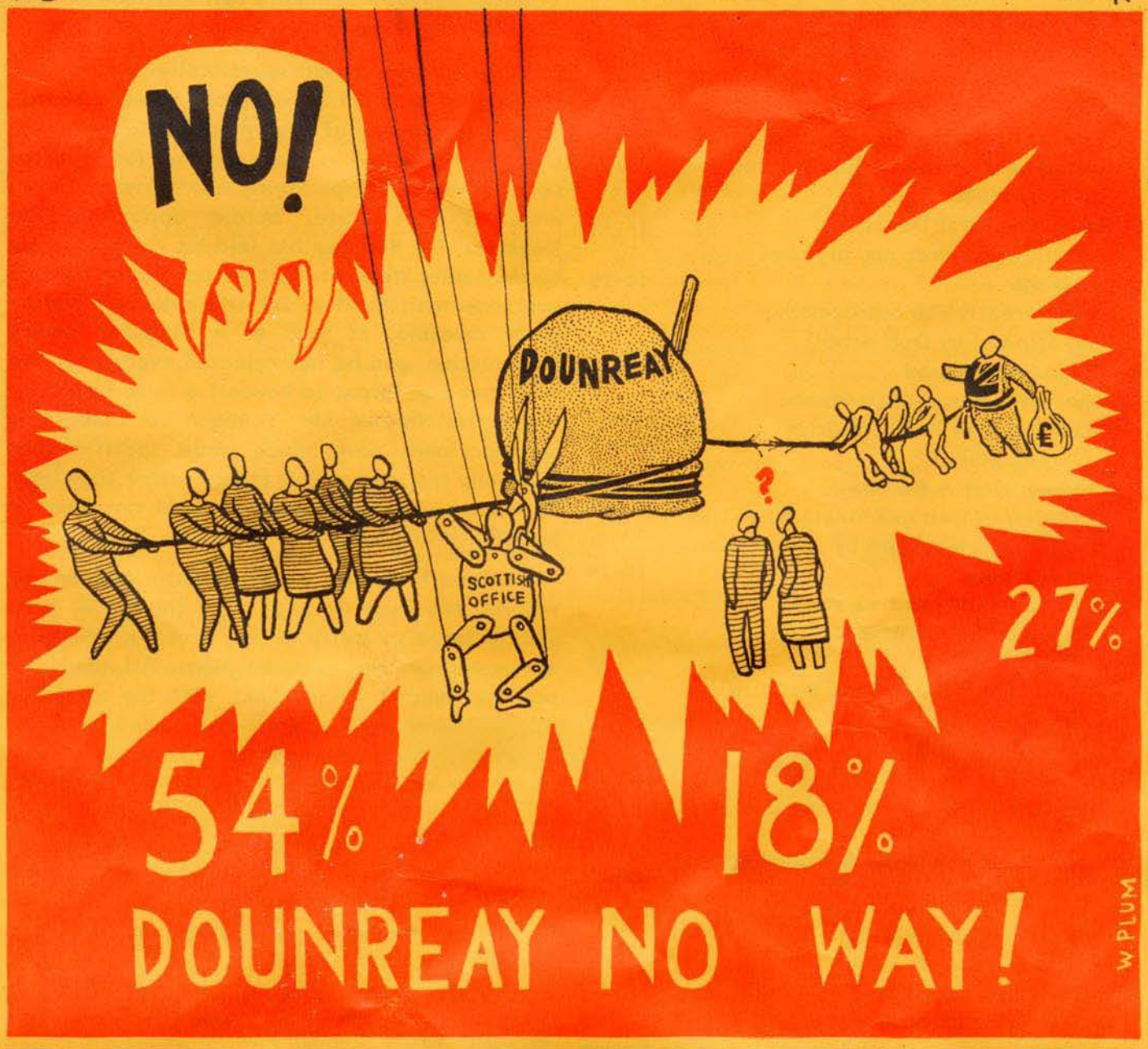

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Comment

So now we know. The Scottish Secretary has announced a local public inquiry into the Dounreay reprocessing plant application, and he has rejected calls for a wide-ranging Planning Inquiry Commission. As mentioned on page 3 of SCRAM 49, a Planning Inquiry Commission is the only forum in which the application can be fully examined, and a local inquiry can only look at land-use planning and local environmental matters.

The announcement specifically stated that the inquiry 'will not be extended to an examination of the merits of government policies on the UK's participation in the European fast reactor collaboration'. In specifying the terms of reference at this state, before appointing the Reporter, Mr Younger has laid his cards squarely on the table. We wrote to him demanding a year's postponement, funding for the objectors and an early meeting, as well as a Planning Inquiry Commission, and he has rejected everything. We feel that our threat to boycott a local public inquiry has forced Mr Younger to make this announcement now, much more specific than is usually the case at this stage, rather than later because he realised that he could not keep us hanging on any longer.

And he has made a mistake. Our opinion poll results, revealed on page 3 of this issue, show that a large majority of the Scottish people do not want this reprocessing plant. All shades of political opinion in Scotland, with the exception of the Tories, have expressed the view that this proposal is far too important to be considered at a mere local inquiry.

So we say again: Come on, Mr Younger, don't be shy, let's have a full inquiry. If you really believe the merits of your case, put them to the test at a Planning Inquiry Commission.

This magazine is produced for the British Anti-Nuclear and Safe Energy movements by the Scottish Campaign to Resist the Atomic Menace (SCRAM).
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Scotland Says No!

Public opinion in Scotland is strongly against the construction of a plutonium reprocessing plant at Dounreay. Despite this, the Scottish Secretary announced on September 18 that a local public inquiry will be held into the application, and its remit will specifically exclude examination of government policy. Steve Martin analyses the opinion poll which revealed this strong opposition.

Over half of the people questioned in a recent opinion poll believe that the plans for a European Demonstration Reprocessing Plant intended for Dounreay should be cancelled, and only a quarter support the scheme. These results show that the Scottish people are overwhelmingly against the proposals of the UK Atomic Energy Authority (UKAEA) and British Nuclear Fuels (BNFL) - supported by the Department of Energy - BY A FACTOR OF TWO TO ONE.

The opinion poll was commissioned by SCRAM and was conducted during the last week of August by System Three Scotland. Three questions were asked in all, and the responses to each question are very encouraging for the environmental movement. The three questions, and the break-down of their responses, are shown in the box. The results from all three questions show strong feelings against nuclear power in Scotland and reflect the hard work carried out by the environmental movement over the years; this work is now beginning to reap rewards.

The North Says No!

The most heartening aspect of the Dounreay results is that seen when they are broken down into geographical areas. The poll shows that, even in the north of Scotland, there is a majority of people against the fast reactor fuel reprocessing plant. This finding flies in the face of claims by the UKAEA that the people around Dounreay, who have lived with the fast reactor research establishment for nearly 30 years, are fully behind the expansion plans. The passive support the Caithness people have exhibited in the past for Dounreay is no more than their ransom payment for the jobs blackmail being extorted from them by the UKAEA and their supporters - the Highland Regional Council and the Government.

The high profile campaign pursued by the Dounreay management has clearly backfired. Never a week passed over the last four months when a letter or statement emanating from Dounreay appeared in the Press or was broadcast on the radio or television. Despite this vast amount of 'information' provided by the applicants (or maybe because of it) more people in the north remain undecided than in the rest of Scotland. Moreover, one and a half times as many people are against the plans than in favour. There must surely be a lesson to be learnt there!

However, the most angering aspect of the issue is that Mr Younger, the Scottish Secretary, announced that the inquiry he has called to examine the application will not be allowed to examine the Government policy of participation in the European fast reactor collaboration. The calls made by the environmental groups, the political parties, and the Island Councils of Orkney, Shetland and the Western Isles, for a wide-ranging Planning Inquiry Commission have been rejected out of hand. In response to this demonstration of utter contempt for democracy, SCRAM and a number of other organisations, have decided not to participate in this mockery of a public relations exercise for the nuclear industry; funded I may add, by the taxpayer. More organisations will surely follow.

No Nukes, Close Windscale

The results from the other two questions are just as encouraging. 59% of the people questioned want no more nuclear power stations to be built in Scotland (only 23% are in favour of such a proposal). The progression of Torness seen against a background of industrial closures, rising unemployment, falling investment and increasing electrical generating overcapacity, has played a major role in hardening public opinion against nuclear power in Scotland.

Perhaps most exciting is the large majority of people in favour of closing down BNFL's Windscale reprocessing plant - closing down, not demanding reduced or zero discharges - despite the fact that the plant is situated in England whereas the other questions referred specifically to Scotland.

We can draw great satisfaction from these results. But the fight is by no means over; around a fifth of the people questioned are still undecided. We have to redouble our efforts at informing the public about the hazards and insanity of nuclear power, and we have to build on the successes we have already gained. More trade unions are passing anti-nuclear motions, political parties are starting to look at the energy questions - although they are not yet seeing what we are and the media has become more sympathetic. SCRAM celebrates its tenth birthday this November; let's hope that, ten years from now, we can look back and say 'there was the turning point'. Nuclear power: together, united we can stop it.

Should plans for building a reprocessing plant at Dounreay go ahead, or should they be cancelled?

	Total	Male	Female	West	East	North
Go ahead	27%	37%	19%	25%	27%	32%
Cancelled	54%	51%	57%	57%	55%	48%
Don't know	18%	12%	24%	18%	18%	20%

Should there be more nuclear power stations built in Scotland?

Yes	23%	32%	15%	22%	24%	24%
No	59%	53%	65%	61%	59%	57%
Don't know	18%	15%	20%	17%	17%	20%

Should the Windscale reprocessing plant be kept open or should it be closed?

Kept open	29%	36%	23%	29%	28%	30%
Closed	49%	49%	50%	50%	51%	45%
Don't know	22%	15%	27%	21%	21%	25%

The disposal of radioactive waste; can it be done safely? This was the title of a debate held by the British Association for the Advancement of Science (BAAS) at Strathclyde University on August 28. The 'debate' was in fact no more than a public relations exercise for the nuclear industry.

The panel comprised Dr Lewis Roberts of the UK Atomic Energy Authority, Geoff Webb of the NRPB (National Radiological Protection Board), Jean-Pierre Olivier of the OECD (Organisation for Economic Co-operation and Development) and Professor Terence Lee of the Surrey University psychology department. Keith Bovey of Scottish CND replaced Peter Taylor at short notice and spoke of the military implications of nuclear power.

Dr Roberts glorified the technical excellence achieved in dealing with and disposing of radioactive waste, and Geoff Webb attempted to explain how the International Commission for Radiological Protection set their 'safe' limits for radiation exposure. M. Olivier endorsed the sentiments of the previous speakers and, with the use of visual aids, he explained how simple it is to dispose of radioactive waste. Using *French* glass, disposal under the seabed is safe, provided one avoids the techtonic plates of the continental shelf, he claimed.

Professor Lee felt there was nothing wrong with nuclear technology; its critics are stupid and emotive. He condemned the critics for accepting other new technologies while rejecting nuclear energy and claimed that the public had an unnatural fear of nuclear power. He also condemned the industry for its failure to combat this fear and felt that its PR image needs attention.

There were not many questions following the panel's speeches. When it was suggested that the Dounreay proposed reprocessing plant would provide plutonium for the military, Dr Roberts became most upset and claimed that there is absolutely no military connection. Another questioner referred to an industry statement that in the case of high level waste disposal 'a certain amount of leakage is acceptable' and asked 'acceptable to whom?' and 'could the leak be stopped?' Mr Webb stated that if a leak occurred it would be *dealt with at that time*. M. Olivier disagreed and asserted that the French do not accept any leaks, *none at all*.

It is sad that such an illustrious body as the BAAS should be involved in an apology for a debate such as that which took place on August 28.

Margaret Ralley
SCRAM Ayr

Thousands of tonnes of nuclear waste may be dumped in the desert area of Darfour Province in the Sudan. After secret negotiations in January, West Germany, Austria and Sweden will be able to dump high level waste in three valleys to the north of El-Fasher.

The deal, worth $4 billion, came to light after the military coup earlier this year. German industrialist F J Gettys, a specialist in transporting and disposing of nuclear materials, will carry out the project.

The area proposed is on a camel route frequented by nomadic tribes and is presently in the grip of famine. Poor road conditions mean that leaks in transit are likely, and no geological studies have been carried out in the area suggesting a potential risk of groundwater contamination.

China's Gobi Desert may also be a recipient of nuclear waste. A deal signed in June between the Chinese government and Alfred Hempel AG of West Germany has given Hempel the sole European rights to dump an initial 150 tonnes of waste. China has offered to take 1000 tonnes provided the West German government buys 6000 tonnes of Chinese uranium and other metals.

Many Third World states have been involved in a search for Western nuclear waste dump sites. Sadat's Egypt was to take Austrian and West German waste in 1979 but pressure from environmentalists prevented the deal. Two ships did attempt the journey: one was forced to cut short its trip and offloaded in Southern Italy and another made several unsuccessful attempts to dump its cargo illegally in various countries.

New Scientist 5.9.85

Druridge

IAN BARKLEY

Some of the cottages the CEGB has offered to buy.

The proposed purchase of 13 houses in Druridge hamlet for £500,000 is another example of the CEGB's new public relations approach to nuclear development, and follows the purchase of 300 acres of land for £700,000 as a potential power station site last year.

Tired of being portrayed as the Big Baddy of the energy world, we believe the nuclear industry is copying the French approach. This has two aspects, first to stifle public debate by cutting the planning procedures down to the minimum, and second to make up for this curtailment of freedom by offering financial and other compensations. Compensation such as house purchase in blighted areas near prospective nuclear plants in an attempt to buy the goodwill of the local people. Although it may be helpful to the house owners involved, it is another red rag to a bull as far as most local people and the Councils are concerned.

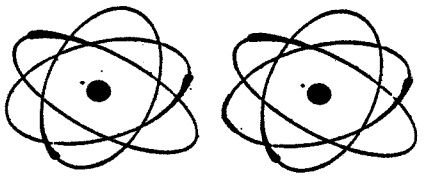
The CEGB have offered us bland soothing Druridge briefs, supposedly to reassure us about jobs and safety etc. They are now kindly offering to buy up blighted property; blight caused by their plans. We may be sure they will try other sugar coated pills in the future. Pleasant picnic parks and nature trails round the power station, as at the Elstow nuclear dump near Bedford? Perhaps a sports centre at Widdrington? Unfortunately for the CEGB British regulations forbid the supply of cheap electricity for areas near nuclear power stations, as in France. Be alert, this will not be the last exercise in public relations by the CEGB.

Bridget Gubbins
Druridge Bay Press Officer

A more efficient centrifugal separator for uranium enrichment has been developed in Japan, claims the Japanese Power Reactor and Nuclear Fuel Development Corporation. A one year reliability test programme began in April on the RT-2 separator which is expected to be 50% more efficient than existing machines.

Ironically, this advance in the technology comes at the time as the US have halted work on a new enrichment plant at Portsmouth, Ohio. The US plant has already cost $2,600m and, because worldwide demand for uranium is one sixth of what it was when the plant began construction and there have been economic improvements to the old diffusion plants, the new facility is no longer viable. Three thousand centrifuges built for the Portsmouth plant will now go into storage.

Modern Power Systems, August 1985



Storage

A US Congresswoman has announced her opposition to the siting of a Monitored Retrievable Storage (MRS) facility at Oak Ridge, Tennessee. Democrat Marilyn Lloyd believes that the facility would be an obstacle to local economic diversification and it would hinder efforts by communities to become less dependent on Department of Energy Programmes. She said, 'Realistically, given the fear that some have regarding things nuclear - especially nuclear waste - I do not think an expanding company would choose a community which has had the environmental problems Oak Ridge has faced plus a nuclear waste storage facility, no matter how temporary that facility is supposed to be'.

Nucleonics Week 25.7.85

Industry

Canada and Turkey have signed a nuclear co-operation agreement. This has been made possible by Turkey's assurance that nuclear plants and materials will not be used for weapons manufacture and that they will abide by the Nuclear Non-Proliferation Treaty. However the finance of the deal has not yet been finalised. Turkey wants Atomic Energy of Canada Ltd (AECL) to own and operate the CANDU reactor for 15 years, recovering construction costs from power sales. The cost of the project is estimated to be about $1000m, and the Canadian government will be asked to pick up the tab.

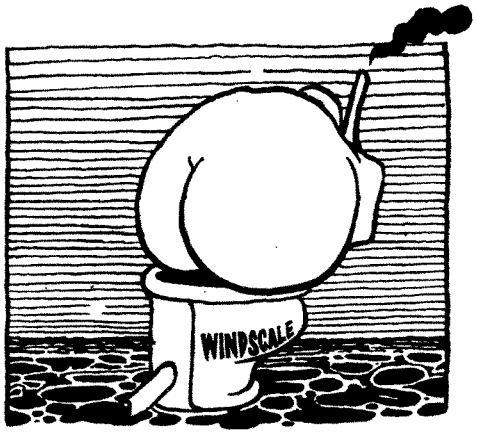
Modern Power Systems, August 1985

The results of a survey into radioactive pollution of the Solway Firth were published at a press briefing on Friday September 13 in Stranraer. Readings were taken in Wigtown Bay and the Cree Estuary and showed concentrations as much as three times higher than those observed in the latest Government report published by the Ministry of Agriculture, Fisheries and Food (MAFF) in 1983.

The independent survey was carried out by Dr Robert Wheaton of Edinburgh Radiation Consultants, for the Radioactive Pollution Survey for Wigtownshire (RPSW) - a group of concerned local people. The RPSW group raised £2000 locally to have the study undertaken.

Samples were taken from ten points in the area in January 1985 and the tests were carried out according to International Atomic Energy Agency methods. Because of the ratio of concentrations of plutonium 239 to other isotopes of plutonium - 1 to 5, approximately the same ratio as the discharges from Windscale - it is almost certain that Windscale is the source of the contamination.

There are two major observations in the report. The first is that the maximum activity of Americium-241 in the silts, assuming no more is added in the future, will be reached in 75 years. This is because the Plutonium-241 discharged, with a half life of 15 years, decays to Am-241 (half life 433 years). From data produced by MAFF it can be estimated that the total acitivity of Am-241 in 75 years will be equal to the present Am-241 activity plus the present Pu(239-



240) activity. And, according to National Radiological Protection Board publication 109, the dose per unit uptake and the concentration factors are both higher for Am-241 than for Pu-241 - it is more dangerous!

Dr Wheaton goes on to show that radioactive contamination is greater the further up the Cree estuary one samples, as it becomes concentrated in the silt. The report criticises the official programme of only one sampling point, at Garlieston on a promontory in Wigtown Bay and suggests that several points should be used, particularly further up estuaries to give a better indication of the true pollution of the area. There is also a problem with flooding of arable land on the banks of the river Cree, thereby delivering the contamination into the food chain.

Contact: RPSW, c/o Alan Richards, Dhuloch School, Ervie, Stranraer, Wigtownshire

Dounreay Developments

The Campaign Against Dounreay Expansion has moved fast since July as the protagonists jostle for postion.

The Highlands

Highland Regional Council held a public meeting on Monday 9th September in Thurso. It was apparently planned to let the Council hear local opinion of the UKAEA/BNFL proposal to build a plutonium reprocessing plant at Dounreay. Adverts had been placed in local papers in Orkney and Shetland as well as in Highland Region.

Over 100 people turned up, including 30 councillors and officials. The chief executive of Highland Region, Mr Cameron, sat on the stage with members of the planning committee and planning officials.

The audience consisted of people from Orkney and Ross-shire as well as Sutherland and Caithness. One large group consisted of fishermen led by Mr Bob Allan of the Scottish Fishermen's Federation.

There was a lengthy argument about the application itself. The inadequacy of the information supplied by the applicants was regretted by the planning officials as well as deplored by much of the audience.

Transport especially was a major topic. Since the UKAEA and BNFL do not appear to know what they're doing, everyone in the hall seemed to be slightly concerned, at least, about this. The methods proposed for transport, for instance, could provide vital clues about the eventual fate of all its nuclear waste.

A number of people, especially Alistair Macleod from Orkney, spent time explaining alternatives for both the Dounreay site and employees of UKAEA. Local people decried the lack of other investment in the area and a farmer asked if Dounreay's presence discouraged other developments.

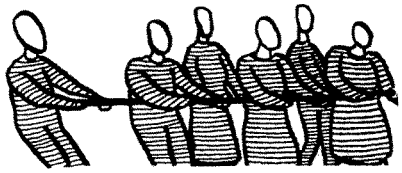
Councillor Rhind and others had visited Sellafield recently and Mrs Rhind stoutly declared herself delighted with everything and everyone she'd seen there. Mr Allan for the fishermen, told her that wasn't what his colleagues in the Irish Sea fishing industry told him.

The meeting was significant because of the presence of Caithness farmers

and fishermen who were for the first time open and voluble in their criticism of the planned expansion.

Frances McKie
The Dunters

The efforts of the Highland Regional Council to seek the views of its electors



on the BNFL/UKAEA plans for Dounreay have been forestalled by the Scottish Secretary's announcement of a local planning inquiry before the Council had completed its consultations, and before it had made its representations. While the Council's consultant's report had been delayed because the UKAEA was unforthcoming on its plans, particularly for transport of spent fuel and waste management, Mr Younger has shown his obvious disregard for the democratic process and for the views of the Highland people and their elected representatives. Further public meetings to follow the one in Thurso, reported here, have been pre-empted by the announcement. The demand for more information by the Highland Region on nuclear transport appears to have caught the UKAEA out and it now seems to be having to do some belated homework on the relative merits of different ports on the East Coast.

Caithness

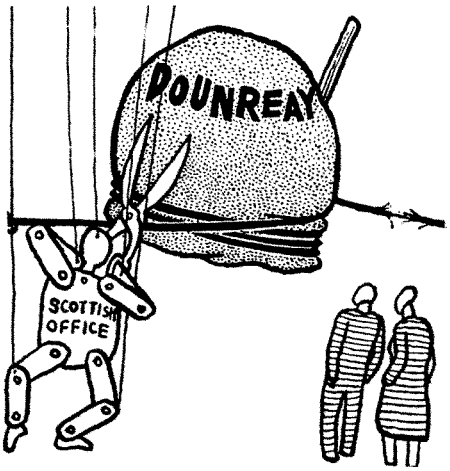
Local confidence in the Dounreay plant has been shaken by recent events. Dounreay Management has taken a bit of a battering in public on the conventional and nuclear safety record of the existing plant, following revelations of radioactive particles on beaches near the plant, a near fatal accident in which a worker at the plant was fed Argon instead of Oxygen, and an incident in which a fishing boat, chartered to monitor radiation levels in lobsters, inadvertently hauled up a 2' section of a low-level waste discharge pipeline. The piece of pipe gave an internal reading of 150 millirem/hour, 15,000 times background. Following the court judgement which fined BNFL £10,000 for criminal negligence for excessive discharges of radiation in 1983 at Windscale, the UKAEA has tried to distance itself from BNFL involvement in the proposed plant, although the UKAEA is a 100% shareholder in BNFL.

Underhand methods of persuasion by the supporters of the application have been discovered: 15 of the letters sent to the Highland Region in support of the planning application have been found to be forgeries.

On the debate concerning jobs, it is now known that the Dounreay establishment expects to lose 150 jobs by natural wastage over the next 6 years. The new plant will only create sufficient jobs to redeploy 300 workers.

A wildcat strike in September by subcontracted electricians on the site occurred when two men were suspended for refusing to work in a radioactive area. One of the two was found to have overalls contaminated with radioactivity after working in a 'clean' area the previous week. The EEPTU branch secretary at the site, Peter Kelly, persuaded them to return to work after the two men were reinstated.

The Thurso Trades Council, which is dominated by the Dounreay Trade Unions and by the local construction



industry which depends on Dounreay, is predictably in favour of the new plant, but the Caithness Area National Farmers Union has objected to the proposals, only in order to have a say in the inquiry, and the Scottish Fishermen's Federation has also objected following the narrow remit announced by George Younger.

And the Islands

The Island Council's consultants reports, published in early August, said that the planning application by BNFL/UKAEA provided too little information to assess the proposal. This 'unacceptable' lack of information led the Islands Council to object formally to the proposals and to tell the Highland Regional Council that it should turn down the proposal on these grounds alone. The Island Council's request that the applicants should be required to submit an Environmental Impact Assessment (EIA) and a Hazards Appraisal of the proposed plant before an inquiry is announced has in fact now been insisted on by Mr Younger. Interestingly, an EIA is required to be submitted (by Scottish Office guidelines) at the same time as the planning application since the construction of storage facilities for radioactive waste forms part of the proposal. The applicants have broken another guideline as they have also failed to justify the production of radioactive wastes. The Island Councils have pressed for a Joint Planning Inquiry Commission and have been incensed to learn that an EIA had been carried out by Dounreay before the planning application was lodged, but not published.

Party Political Support

An executive meeting of the Scottish Council of the Labour Party in August decided to seek the views of its affiliates on the Dounreay proposals. Calling for a full Planning Inquiry Commission, it hoped that it would have the support of its members in doing so. The SNP have demanded a wide ranging planning inquiry. The Liberal Party has privately lobbied for a full inquiry and for funding the objectors, but publicly it has been very quiet so as not to disrupt its Alliance with the SDP or to open the evident rift between Jim Wallace (Lib., Orkney) and Robert Maclennan (SDP, Caithness). Fringe meetings have been held at Party and Trade Union Conferences.

International

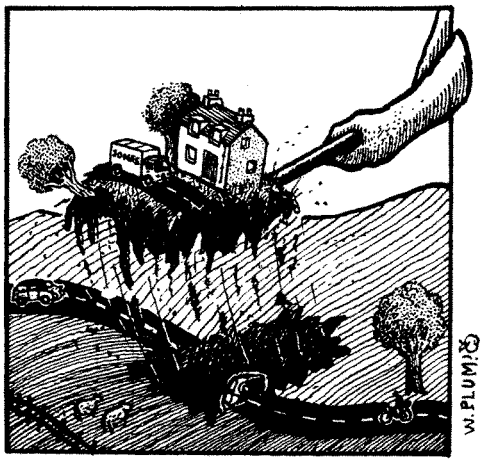
As a result of lobbying by the Campaign Against the Dounreay Expansion (CADE) and of contacts between Norse and Scottish fishermen, the Norwegian Government has taken an interest in the Dounreay plans. It became an issue in the Norwegian General Election. This pressure resulted in Norway making an official approach to the Scottish Office for information on the proposal. Denmark is being lobbied by CADE (Shetland).

France appears to have brought forward the date on whether to proceed with plans for a 50t./year capacity reprocessing plant, termed 'MAR600' for

her Marcoule site. A decision on this is now expected late in 1986; the British government's rushed programme for Dounreay seems to have forced France's hand, but the rivalry between the two countries will keep the pressure on the British Government to minimise public debate.

The Big Bite

The drive for 'economic' coal production by the National Coal Board (NCB), the main reason for the recent pit strike, is now leading to an expansion of capacity in open cast coal mines. In attempting to reduce the cost per tonne the NCB is conveniently ignoring the environmental costs incurred by open cast mining: damage to property, destruction of the natural environment and rising unemployment. Colin Jones of the Brynna Anti-Opencast group details the threat to South Wales from the NCB's plans for the area.



I can quite understand the concern of people who live in the vicinity of where we want to opencast, but of course we cannot have it both ways. . . We either satisfy the environmental requirements or we satisfy the coal requirements, but we are not capable of doing both at the same time.

Sir Derek Ezra - evidence to Select Committee on Nationalised Industries - 1977/8.

Opencast mining in South Wales is a highly mechanised industry. The workings are often 500 feet deep on sites of 800-1000 acres and create 'voids' of over 30 million cubic yards. Despite grandiose National Coal Board plans to restore the land to country park type areas (at local authority expense), most exhausted sites are returned to rough agricultural land with the occasional stand of conifers struggling for existence. When fully worked, the voids are often used for landfill refuse tipping.

The majority of opencast sites in the region are sited in rural areas on the edges of coalfields. They destroy large tracts of the countryside each year. Workings often come to within 20 yards of housing and the dust, noise, vibration and blasting associated with them are intolerable. Near Methyr Tydfil in the North, people are literally shaken out of bed. At Llanharan in the South, house foundations have suffered severe cracking.

Drive for Profits

However, these social and economic costs are not considered by the NCB in their drive for profitability. The blunt reality that the cost per tonne of opencast is lower than that from deep mines has formed the basis of an apparent change in direction of the Coal Board's policy in South Wales. Since its inception as a wartime crisis measure in 1941, opencast mining has filled a traditional role of supplementing deep mined output but 1982 marked the start of a trend that would eventually tip the balance against deep mining. That year, the NCB Opencast Executive issued consultative documents which indicated a rapid short-term increase in opencast output. In Mid Glamorgan alone the Board expressed a 5 to 10 year interest in extracting 45% of the known reserves suited to opencasting. This trend has accelerated since the end of the Miners' strike.

Previous NCB opencast working had been for specialised coals such as anthracite and high grade coking coals which were not usually accessible through deep mining, and for which there was a ready market. However, current plans to expand the opencast sector seem to be aimed at extracting coals which have always been the domain of deep mines. Should these plans go ahead, there would be serious adverse effects on employment and the environment.

Massive Stockpiles

The Llanilid site on the south crop of the coalfield is the largest in Western Europe (880 acres). From 1986, the NCB intends to progressively extend this site over a further 1500 acres. This would encircle the village of Brynna on 3 sides and destroy mature woodland and important wetlands. A hamlet and many farmhouses would be lost, as would breeding streams noted for sewin and trout. The Royal Society for the Protection of Birds estimates that 76 breeding species of bird could disappear from the area. The 'prize' for the NCB is non-prime coking coal of which there are many millions of tonnes stockpiled in South Wales. Coals of similar quality are available from pits such as St John's Maesteg which is under threat of closure on 'economic' grounds. The NUM fear that these developments around Brynna could effectively kill off the promised Margam Super Pit which would provide coking coal direct to the Port Talbot Steelworks.

A similar situation exists on the north crop of the coalfield at Dowlais. There, the Board plans to extract 4 million tonnes of bituminous coal over a 16 year period, commencing in 1988. This site would be working the reserves currently mined by the Merthyr Vale colliery. They are also exploring another potential opencast site that would be very close to housing and factories.

Along the western edge of the coalfield, things are much the same. Opencasting for anthracite is long established there although the NUM has been pressing for a viable deep mine at Ffos Las for 10 years. Whereas the NCB had previously been in favour of the new pit, money is not now available. However, money has been found for new opencast developments near Ammanford.

The only area of the coalfield where opencast activity may be said to be quiet is in Gwent, but County Council policy may have a bearing on this. Since 1983, the Council has opposed all opencast developments except in areas that are already derelict.

The NCB Opencast Executive has an annual production target of 15 million tonnes. This was set by Government in the 1970's based on NCB forecasts of a total demand of 150 million tonnes a year. The opencast target has never been reduced although overall demand levels have fallen dramatically, especially for coking coal because of cut-backs in the steel industry.

Why opencast output has not been reduced in line with demand is a mystery unless it is simply the pursuit of profit at the expense of countryside and communities. With the best will in the world, the Coal Board cannot hope to adequately restore an opencasted landscape that had taken many thousands of years to mature. Their restoration efforts to date are a testament to that. Just as important is the threat to jobs. Opencasting provides little employment, nor does it create service industries to the extent that deep mining does. The displacement of collieries by new opencast sites has therefore become a major concern of the mining unions and communities. The very mention of possible opencasting in an area is enough to ward off potential new industries. No incoming business is interested in setting up near a major surface extraction.

Opencasting is a quick and inexpensive way of getting coal. Would it not therefore make sense to preserve those easily accessible reserves and extract them only at a time of national need or emergency? After all, the NCB are continually complaining of overcapacity in the deep mining sector.

Magnox South East

Following on from our successful series on the AGR's over the past year we are now running a short series of articles looking at the performance of the Magnox reactors, the first programme of nuclear power stations. In the last issue Hugh Richards compared the Welsh stations with the Westinghouse PWR planned for Sizewell B. Here Tim Williams describes the three Magnox stations in the south east - Bradwell, Dungeness A and Sizewell - and concludes that the Central Electricity Generating Board (CEGB) are keeping the stations going way beyond their design life, despite the appearance of numerous cracks in the coolant circuits.

There are three Magnox stations operating in the South-East of England - Bradwell, Dungeness A and Sizewell. They were commissioned in 1962, 1965 and 1966 respectively and so are approaching, or have passed, the end of their original design lifetime of 20 years. In 1981 the CEGB extended this to 25 years, and are now talking about the possibility of 30 years. In any event, the Magnox stations are getting elderly.

One consequence of this is that their excrement is starting to pile up. Magnox fuel cans have fins protruding from their sides which position the fuel in the channel. These are technically known as 'splitters'. When the spent fuel is removed from the reactor and transferred to the cooling pond pending transport to Windscale, the splitters are sheared off by remote controlled machinery in order to save space in the transport flasks and to make processing easier at the other end. The splitters drop into a storage vault under the fuel dismantling unit - and there they stay.

There was no provision made in the original design for clearing the storage vault out. If the operators had stuck to the intended lifetime this would have been fair enough - though what would have been done with the vault on decommissioning is not clear. But, with an extended lifetime, the vaults are threatening to overflow.

Nuclear Enema

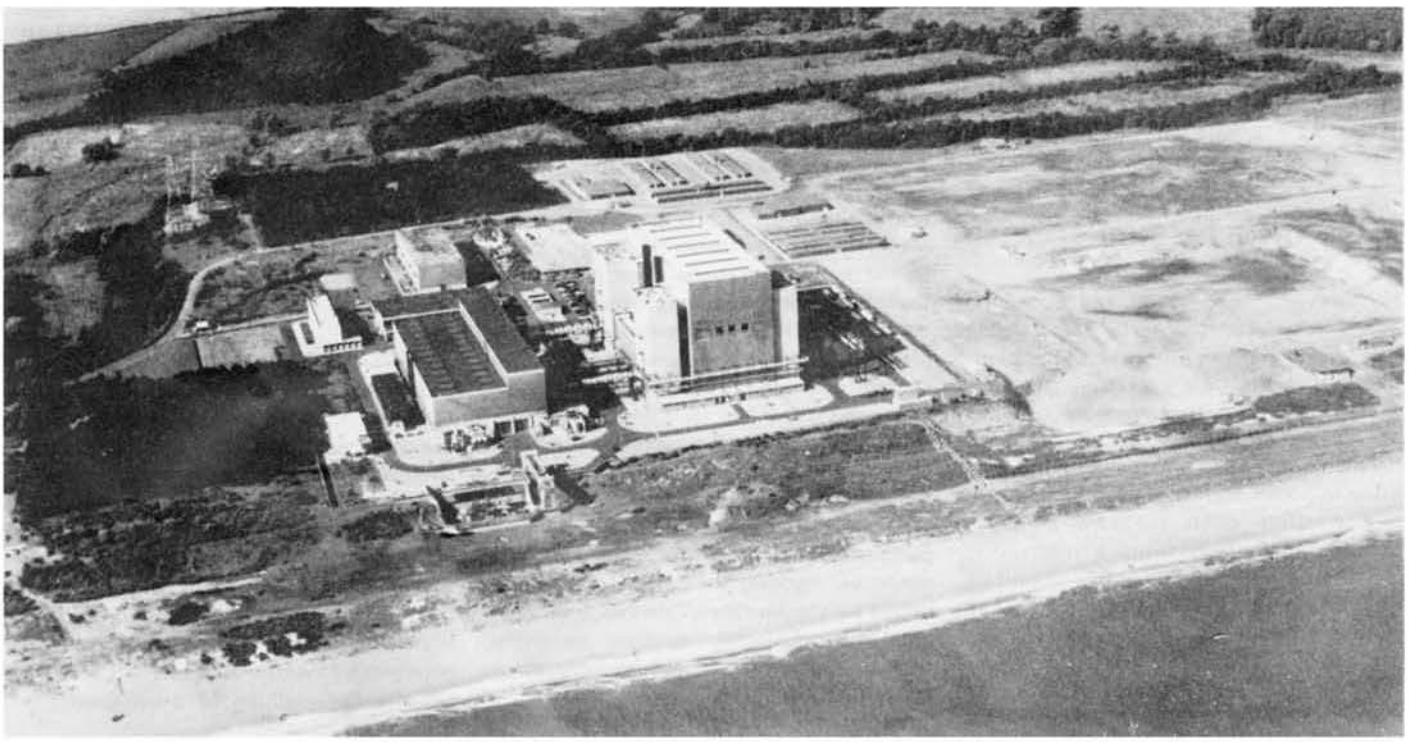
So far, the CEGB has dealt with the problem by poking a mechanical arm into the top of the vault to flatten out the junk-heap and make more room. But, at one station at least, the problem has grown so acute that the Board has actually been forced to do something about it. Davy McKee Nuclear of Stockton is building a 'Magnox Dissolution Plant' for Dungeness A. This will cost over £1m and is intended for completion by the end of 1986. The plant will 'substantially reduce the inventory of the vault', and as an extra benefit the magnox will be recovered by dissolving it in carbonic acid - adding another source to the growing stock of intermediate-level wastes that must be disposed of. In the old days, we used castor oil to relieve constipation. . .

Down-rating and Repairs

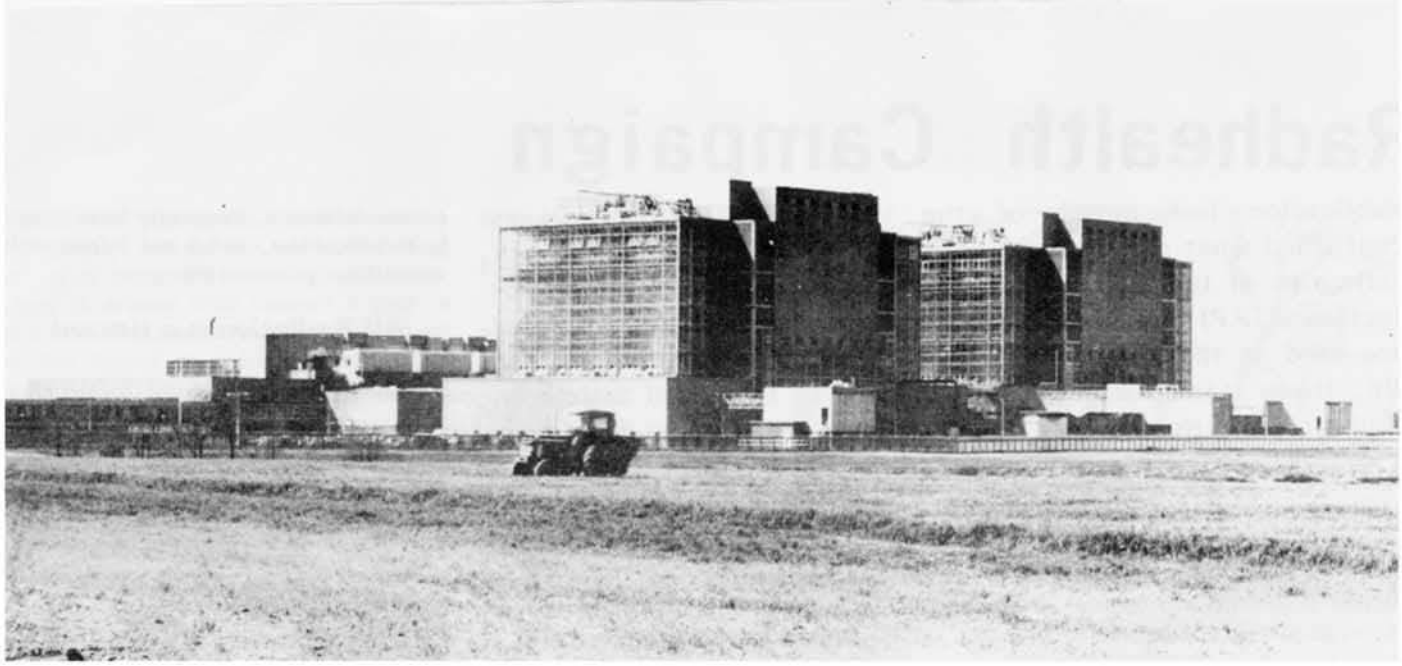
Meanwhile, the stations stagger on. Their performance is not particularly impressive; in Nuclear Engineering International's latest ranking of worldwide stations by load factor, the highest of the three was Bradwell (also the oldest) at 151 out of 230.

One of the reasons for this is that the NEI ranking is based on the design rating of the station. Shortly after the Magnox stations were commissioned, the CEGB discovered a corrosion mechanism which was highly susceptible to temperature; in order to reduce its effect they decided to lower the maximum operating temperature, thereby also lowering the maximum power output of the station. This new, lower output is referred to as the station's 'declared net capability' (DNC). The table shows the differences between DNC and design rating. All the Magnox stations have been down-rated in this way, by varying amounts. Use of the DNC rating allows the Board to claim more optimistic operating figures than is actually the case.

There is another reason for the poor overall performance of these three stations. Along with Berkeley in Gloucestershire, they were shut down for an extended period in 1980/81 for repairs after metallurgical weld cracks were found in the high-pressure gas coolant circuits. The subsequent outcry when the reactors were re-started is well do-



the Sizewell site,



The Bradwell Magnox nuclear station,

cumented (see for example Anthony Tucker, 'Starting Blocks', *Guardian* 26.9.81). The expansion bellows, which were a major cause of concern, have been replaced with extra internal bracing struts welded to them. But cracks in other, less accessible, parts of the structure remain, and it is a matter of engineering faith as much as anything that they will not lead to a sudden catastrophic failure in the huge ducts which transport the coolant gas from the reactor to the steam boilers.

Accident Consequences

What would be the consequences of such a rupture? One of the advantages of gas-cooled designs over the pressurized water type (such as the Sizewell B proposal) is that, because gas is compressible while water is not, a small leak in the circuit will depressurize the system slowly, allowing time for operator intervention. Even a large crack may not leak quickly, because the gas is circulating at supersonic speeds and might therefore not 'see' the crack - though this is quite unpredictable. The same size of a leak in a PWR would bring rapid depressurization and a major accident.

The worst case for a Magnox station would be a catastrophic 'guillotine' shear in the duct between reactor and boilers. In this case there would be an explosive decompression of about the same magnitude as the Flixborough explosion - hundreds of tons of carbon dioxide let loose in the reactor building in a few seconds.

Now this gas is fairly radioactive, being in intimate contact with the core, but once released into the atmosphere its radioactivity would soon be diluted to very low levels. The hazards of such an accident lie elsewhere.

Firstly, the mechanical shock of the explosion, or the sudden change in pressure, could distort the core, preventing the control rods from falling in and shutting down the reaction. (Earthquake hazards present the same threat.) This would lead in due course to a meltdown; or, if air got into the core even with the reaction shutdown, the graphite and the fuel elements could burn, releasing fission products with the smoke. There are secondary emergency shutdown systems: a hopper full of boron balls which are released into the core (boron is a neutron absorber, the same material as the control rods) and a hopper of boron dust which is blown into the core. This latter effectively destroys the core, by melting onto the graphite and fuel elements, and so is not testable.

Worker Hazards

The second hazard is to the reactor operators themselves, due to enormous quantities of CO_2 being suddenly released into their working environment. The normal concentration of CO_2 in the air is around 330 parts per million or 0.03 per cent. At this level it is vital and necessary in order to allow our breathing mechanisms to function. But above a certain concentration it becomes lethal. The US Occupational Safety and Health Administration lays down a maximum exposure over an 8 hour period of 0.5% CO_2 in air; concentrations over a few percent kill within seconds. Obviously, if the entire coolant circuit contents are quickly dumped into the reactor building, the chances of the control staff surviving unless they immediately don breathing apparatus are negligible. And, with the control staff deceased, the probability of the reactor itself returning to a safe state is pretty low.

The gas circuit bellows and ducting are inspected for cracks at every maintenance shutdown. But the combination of commercial pressure to keep the station operating - it costs around £100,000 a day for unscheduled shutdowns - and the inaccessibility of much of the metalwork, which makes repair difficult or impossible, mean that many cracks, though known, are simply left as they are. Others, due to the impossibility of complete inspection, may not even be known about. The CEGB rely on the 'generous strength margins' and the 'safety in depth' of the original design to carry them through. They also hope that any crack which develops will do so slowly, leading to a gradual leak which will be discovered early rather than a sudden, catastrophic shear. In ninety-nine times out of a hundred they may be right. Dare we trust to luck for the hundredth time?

	Design net rating MWe	Declared net capability MW sent out	Derating %	1984 annual load factor (on design rating) %	1984 worldwide annual ranking out of 230
Bradwell	300	245	81.6	62.9	151
Dungeness A	550	410	74.5	58.7	164
Sizewell	580	420	72.4	39.1	204

(Load factor = $\frac{\text{actual power sent out}}{\text{design rating power sent out for 100\% utilization}}$

Sources: Nuclear Engineering International April 1985
Electricity Supply Handbook 1985

Radhealth Campaign

Publication last month of the study of UKAEA workers. confirmed what many of us know only too well - the cancer risk estimates of the International Commission on Radiological Protection (ICRP) are seriously wrong. Since these ICRP estimates are used as the basis for radiation protection standards in the UK, these standards now need revising. In this third article on Radiation and Health Tony Webb outlines ideas for the campaign.

The report on the Medical Research Council's study of some of the UKAEA workers has all the hallmarks of an attempt by the National Radiological Protection Board (NRPB) to try and bury the results. Publication was delayed for several months and even now significant data have been omitted from the published version.(1) Journalists at the Press Conference were told that this was all that would be published on this phase of the study.

Even so it is possible to deduce that cancer risks from radiation exposure are 4 to 7 times higher than the estimates given by the ICRP and could be up to 15 times higher.(2) The other studies and reviews of the scientific data already indicate that risks are certainly twice as great as ICRP, probably 5 times as great, and could easily be 10 or more times greater.(2) These outdated ICRP risk estimates are used as the basis for setting 'protection' standard. Standards for worker protection already permit an unacceptably high risk of cancer and genetic damage. The new regulations, due in force in January 1986, will relax these inadequate standards still further. (3)

In the light of this new evidence a number of unions have again called for a reduction of the maximum dose limit from 5 rem (50μSv) per year to 0.5 rem (5μSv). This ten fold reduction is amply justified by the available scientific evidence. (4) On their own the unions are unlikely to win: there is as yet insufficient public awareness and concern about radiation to allow them to force the issue and there is a lot of work still to be done among their own members. What help can the anti-nuclear movement give, and would it be welcomed? There is still little real dialogue and very real mistrust - on both sides - despite important union policy shifts since 1978.

Broad-based Campaign

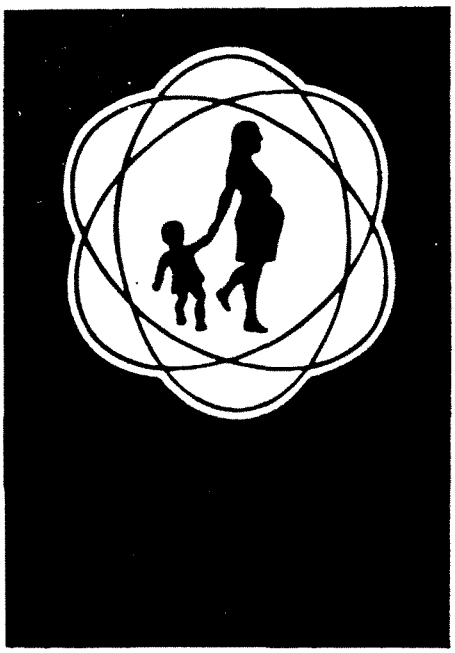
Clearly there is the basis for common cause around the issue of radiation and health. There is equally a need to build a broad-based campaign. There are workers affected, communities affected, and other groups such as the nuclear veterans affected. Why is it that we neither develop these alliances, nor touch the public consciousness on what is after all a vital issue affecting our lives and that of future generations? The public may doubt the sincerity of the Industry's PR staff, may have nagging worries about long term risks, but clearly don't get fired up about it. The risks remain on the margin of being 'acceptable'.

Part of the problem is that the effects on the victims are largely invisible. Teasing out clusters of child leukaemias around Windscale was statistically difficult enough; doing the same around every nuclear installation will be even harder. And, on past form, it will take 20 years before the establishment concedes that the figures are right, and then it will be too late. Part of our problem lies in the way we handle the issue. The fact is that the nuclear industry, while most vulnerable to changes in perception about the radiation risks, isn't the main source of radiation. Most people get more radiation from visits to the dentist than from nuclear power in all its forms.

Don't get me wrong, I'm not saying there isn't a unique hazard from the releases of the nuclear industry but our attempts to explain this problem begin on the defensive, frequently loses people in technicalities, and is not infrequently scientifically inaccurate.

All Radiation is a Hazard

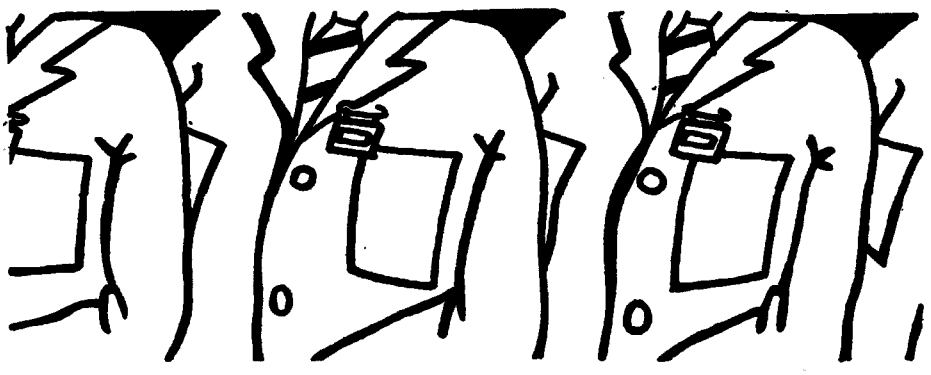
All this is unnecessary; radiation is a hazard wherever it comes from, and all technologies using man-made radiation are part of the atoms for peace programme. When our opponents assert that the nuclear industry releases are



less than those from X-rays we should argue on their own terms. Show just how damaging X-rays are today, were last year and will be next year if we don't do something about improving the regulation of medical radiation exposures. The same ICRP which created the myth of acceptable risks also specifically excluded radiation doses to patients from any form of regulation.(5)

The X-ray is probably the smallest discrete dose of radiation most people will receive. The risks, viewed from the individual patient's standpoint, are very small and usually justified in the patient's mind by the expected medical benefits. Few people realise the total effect of all these X-rays. If we take the figures from the NRPB for diagnostic radiology (medical X-rays and nuclear medicine procedures for diagnosis, not treatment), add the doses from dentistry and the doses received by health care workers in the process, the total radiation dose amounts to 11% of the total received by the population from all sources.

When we say there is no safe level of radiation we are saying that all these little doses are significant: it doesn't

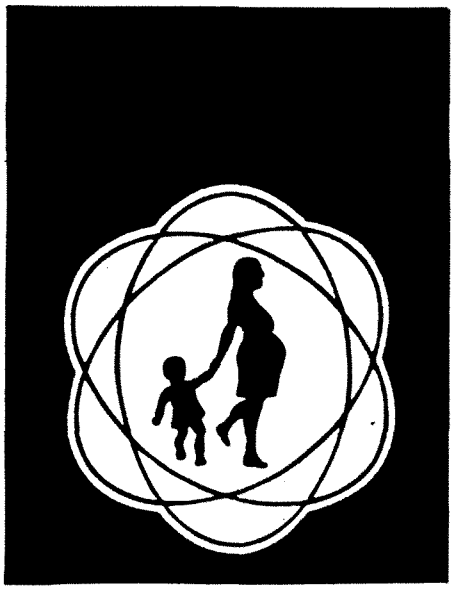


matter how you spread the dose around, the effects will be the same. The total effect of radiation from diagnostic radiology is around 1400 cancers a year in Britain. The range is from a minimum of 350 (based on ICRP risk estimates) rising to possibly 2100 or more.(6)

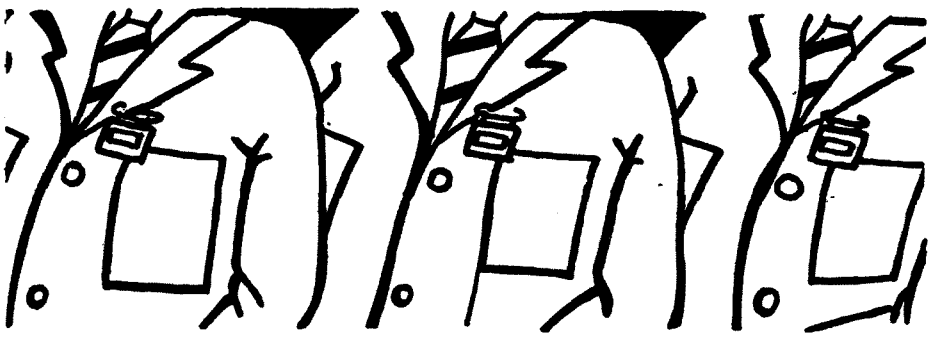
In fact, spreading small doses around a large population can actually be more serious than giving a large dose to a few people - you can only die of cancer once. With many low doses the damage is more widely spread within society's gene pool. Estimates for genetic risk vary widely; as Rosalie Bertell puts it, it all depends on what you count as a 'significant' genetic effect, and what is 'significant' is a measure of the value you put on the future. Using the 'best estimate' for genetic risk from the major reviews of the past 10 years suggests around 600 cases per year (112 if you believe ICRP) rising to around 12,000 possible cases if you take Rosalie's view.(6)

Unnecessary

Take this approach to radiation and health into the public area and suddenly it sinks in: radiation becomes something we all need to care about - not just if you live in Cumbria, or close to a nuclear plant.



Many in the medical profession will overreact to this. They have been avoiding dealing with the issue for too long. No one is saying that all X-rays are unnecessary. Four jumbo jets crashing on Britain every year would make for tighter air traffic safety, not stop people from flying. No one to my knowledge denies that a lot of radiological procedures are performed because it is 'routine' or because the doctor wants to be



'on the safe side' - he or she usually is, unfortunately the patient isn't!

Many procedures are unnecessary and in many cases the doses given for necessary measures could be lower. Alternative imaging techniques such as ultrasound or nuclear magnetic resonance could give as good or better results without exposure to ionising radiation. This is particularly true of many of the newer CAT scans that deliver such large doses, or many of the pelvic examinations on women which deliver such large 'genetically significant' doses by irradiation of the ovaries.

A campaign for improvement in diagnostic radiology would cause a dramatic shift in public perception of radiation risks. This campaign could involve people within the medical profession and the health care unions. There are, after all, more workers exposed to radiation in medicine than in the nuclear industry.

As with the campaign for improved standards, a campaign for control of X-rays won't of itself stop nuclear power. However, it will shift public attention from the very small risk to individuals to the very large risk to society as a whole. It will transform our ideas of 'low level' radiation. Each cancer victim will still not be able to prove radiation the cause. Since compensation will be impossible, the only way to limit the collective damage done will be to force governments to act to reduce exposures.

Building Networks

With this approach to radiation and health we could open up a whole series of campaigning fronts. The Gloucester conference in June began to link the network of communities affected by radioactive releases and build a network of scientific and medical expertise. The aim is to be able to help people to identify radiation in the environment and in people's bodies, measure the physical changes in individuals resulting from exposure and monitor changes in community health.

The same radhealth focus could revitalise the nuclear transport campaign by demanding greater public disclosure of information and more local authority control over movement of all radioactive materials - not just nuclear wastes. This would focus attention on the movement of medical and industrial isotopes that are, in many ways, just as hazardous.

Identifying local sources of radiation and exercising local planning contols over all uses of such radioactive material brings the major concern - what we are doing to ourselves with nuclear technology - down to local community level. It is trite but true that we have to *think globally* but *act locally*. We choose the issues which directly affect people, presenting them in ways they can understand; *then* link these issues together into a broad political campaign. Link the people together into a movement.

Sorry if it sounds simple; great principles usually are, it's only the doing it; the keeping on trying when the going gets rough that is difficult. The Radiation and Health Campaign offers us one such opportunity to try, with some hope of success.

References and further reading:

1) Mortality of employees of the UK Atomic Energy Authority 1946-1979, V Beral et al. British Medical Journal, vol 281 17.8.85.
2) Handbook for Estimating Health Effects from Exposure to Ionising Radiation, Rosalie Bertell, (price £15).
3) Ionising Radiation Regulations, HMSO, 1985, for Critique of all ICRP based regulations see Submission of the Canadian Labour Congress to the Atomic Energy Control Board of Canada on proposed changes to Ionizing Radiation Regulations under the Atomic Energy Control Act, CLC, January '84.
4) General, Municipal, Boilermakers and Allied Trades Union Evidence to the Sizewell Inquiry, GMBATU, 1984.
5) The International Commission on Radiological Protection, P. A. Green & S. A. Wilcox. Greenpeace, 1985.
6) Health Risks from Ionising Radiation given during Medical Diagnostic Procedures in Britain, Tony Webb, RHIS, June 1985.

All the above (except the UK Regulations) and further details available from Radiation and Health Information Service, 27 Windsor Road, London N7.

SCRAM : The First Decade

SCRAM was formed 10 years ago, at a meeting of 25 people on the Torness site on November 15 1975. Since then SCRAM has developed and diversified, from a group opposed to the construction of a nuclear power station at Torness, to become a national campaign. We run an office and extensive reference library on energy issues, and produce this magazine. We have published books and pamphlets, taken part in public inquiries, orgainsed rallies and demonstrations, performed direct actions and lobbied government, the nuclear industry and political parties.

Here we look back at some of the events of the last ten years, in words and pictures. Unfortunately, due to restricted space, we can't include everything that has happened, and we apologise if your favourite moments have been omitted.

The first site occupation was the SCRAM Camp over the Easter weekend 1976 (April 24/25) at Torness. Over 100 people leafletted in Dunbar, listened to music and speeches at the site, and watched Street Theatre performed by Edinburgh University EcoSoc. On Sunday there was a 40-a-side football match.

In 1977 SCRAM held a picket outside the Australian Consulate on Princes St in Edinburgh. We had heard from Greenpeace that a shipment of uranium was due to arrive on Merseyside despite a mass demonstration by Australian trade unions and environmentalists as it left the docks. The picket took place on July 27, the day the uranium arrived in Britain and we sent a telegram of solidarity to the Australian trade unions.

The issue of nuclear waste dumping arose in 1977/8 and some SCRAM people joined a rally in Ayr, organised by the Campaign Opposed to Nuclear Dumping (COND), on January 21 1978. The platform at the meeting at the end of the rally included George Younger (now Secretary of State for Scotland). Mr Younger stated at the meeting: "We should not regard such practices as the burial of nuclear waste as acceptable anywhere in Britain'.

HALF MOON COTTAGE

May 1978 was marked by a mass occupation of the Torness site: 4000 people marched the 5 miles from Dunbar to Torness and camped there the weekend (May 6/7). The Torness Declaration, committing its signatories to taking all non-violent steps necessary to stopping nuclear power, was signed by 30 groups and thousands of individuals.

Out of the May '78 occupation grew the Torness Alliance. The Alliance occupied Half Moon cottage on September 30 1978, the day the tenant farmers gave up their land to the SSEB. The occupation, originally planned to last one week, terminated on November 14 when SSEB contractors bulldozed the renovated cottage into the sea. The following week 400 people responded to a call from the Alliance and came to Torness to watch farmer Jim Thorburn plough the field which the SSEB had taken from him. A concerted non-violent direct action took place on the Monday morning following, which held up the work on site for several hours by people lying in front of the machinery.

The biggest occupation of the Torness site took place on May 5 and 6 1979. Over 7000 people attended the Gathering and listened to music and wandered round the many marquees and stalls. The Sunday saw nearly 3000 people enter the site itself via a staircase made from straw bales provided by local farmers and, although 150 people broke into the machinery compound and caused damage, the police made no arrests and left it to the occupation organisers to handle the situation. The media saw the damage caused as minimal compared to that which could occur once the power station was operating.

The Smiling Sun Shop was opened in October 1980 to act as an information centre and to sell campaign material. The Information Service on Energy educational charity was formed and published the 'Nuclear Energy Questions' information pack for schools. A co-ordinated effort by SCRAM women workers, Lothian Against the War Drive and Edinburgh University Science for People brought Dr Helen Caldicott to Edinburgh and her talk was attended by over 300 people. From out of the meeting on the health effects of nuclear power and nuclear war, the subsequent national speaking tour and a video made of the Edinburgh talk - 'Nuclear Madness' - the Medical Campaign Against Nuclear Weapons developed.

SCRAM moved office to Frederick Street in 1981 and from there we co-ordinated the week of action at Torness from May 10. The first event was an action involving 300 women and children who carried a coffin to the gates of the site and sang and chanted. They attached a 40 foot long banner to the fence: 'No More Toys for the Boys'. On Saturday May 16 150 people occupied a row of cottages at Skateraw beside the site - later renamed Full Moon cottages - and set about making them habitable with the intention of setting up an information and alternative technology centre. The SSEB did their now customary demolition job at 4.30 on Tuesday morning.

The SCRAM caravan was parked outside the main gate to act as an information centre after the Full Moon cottages were demolished. It stayed throughout the summer but had to be removed when the bad weather set in for repairs. To replace the caravan SCRAM erected an enormous sign by the main road proclaiming: 'Torness Plutonium Factory, under construction'. The SSEB moved into land speculation and removed the sign.

SCRAM received some very useful publicity in February 1982 when we appeared on the BBC Scotland Agenda television programme. The programme was very sympathetic and included Roy Berridge (SSEB Chair) and Robin Cook MP. This was SCRAM's second excursion into show business: - we produced an Open Door programme for BBC2 in November 1978.

1982 was a busy year. Our office in Frederick Street was destroyed in an arson attack on April 16. We were very grateful for the incredible generosity of our supporters in this time of need. We moved to our present offices in late April. Monday Apr 19 was the beginning

THE 1981 WOMENS ACTION

of the first Torness pylons inquiry, and SCRAM gave evidence. Later in the year we hosted the Nuclear Free Scotland Conference, jointly with Scottish CND and Friends of the Earth (Scotland), which coincided with the Peace March Scotland arriving in Edinburgh. SCRAM workers had also been heavily involved in the Peace March and producing the Nuclear Free Scotland Campaigners' manual. One of the main strands of the Conference was the forthcoming Hard Rock civil defence exercise and how we could work with the councils to publicise the futility of it all, along the lines of CND's Hard Luck, Hard Rock campaign. We must have done it well because the exercise was cancelled!

Also during the year SCRAM published 'Torness, from Folly to Fiasco', a pamhplet which added to our previous two: 'Poison in our hills' (about the Mullwharcher nuclear waste inquiry) and 'Don't take the A-Train' (about spent fuel transport). We also produced more broadsheets for our nuclear information pack: Nuclear Weapons and Nuclear Power and Warm and Cosy, Insulation and Energy Conservation.

The Sizewell Inquiry started in 1983 and SCRAM published the Pilot Issue of Sizewell Reactions as well as being involved in trying to raise awareness of the issue in Scotland - it was difficult interesting Scots in the goings on in a small village in East Anglia.

In February 1983 the SCRAM Energy Bulletin, which began as an eight page free issue in August 1977 and had increased its circulation up to a maximum 2500 at the height of the Torness campaign, reached issue 34 and had a name change: it became the SCRAM Journal. Most of the seasoned campaigners had left SCRAM by this time and hence things began to get on top of the few people who were still around, so we decided to concentrate all our energy on to the Journal. After a decrease in quality, and in pages, at the beginning of this new effort, things started to improve by the end of the year. We added 'Nuclear Power. . . Problems', 'Trident, the case for cancellation' and 'Windscale' broadsheets to our information pack over the next year.

Towards the end of 1983 the waste dumping campaign started again with Billingham and Bedford. SCRAM people went to Billingham and helped publicise the issues. We also had our own campaign again at the end of '84 with the Torness railhead inquiry, which took a lot of energy out of SCRAM. We bounced back in 1985 with two full-time paid workers - Steve Martin and Frances McGlinchey - and Ian Leveson is helping to co-ordinate the now well-advanced Dounreay campaign. The Journal continues to improve and its circulation is once again on the increase. We have high hopes for the next 10 years!

SCRAM invites all our readers to our birthday party on November 9 and we hope you will be able to take part in the dayschool before it. There is a leaflet enclosed in this issue which gives details of the event. See you there.

Dry Storage

The environmental movement has consistently argued against disposal of nuclear waste. Reasons include its irretrievability in the event of leakage, the implication that reprocessing will continue and the legitimacy attached to an expanding nuclear programme. But there is an alternative. Don Arnott here sets out the background and a possible future direction of a campaign based on a call for DRY STORAGE.

Truth, within the nuclear industry, is highly stratified. You may beaver away in one of the strata and eventually you may think you have wormed out all the facts - and you may even be right about that - and yet all the while, in adjoining strata, it is likely that there are other facts of which you know nothing but which have a fundamental bearing on the position you thought you had reached. The story of dry storage is a good example.

But first: why *dry* storage? The reason is that, when one is dealing with encapsulated nuclear waste (including, for our purpose, spent fuel) the biggest source of corrosion of the containments is water vapour and free oxygen. Eliminate these and all storage procedures become very much safer. Now nobody outside the industry nor, I strongly suspect, within it, has ever understood why the mistake was made of storing spent Magnox fuel under water, with frequently less than happy results in terms of leakage. Only at the end of the programme, at Wylfa, was the logical expedient adopted of storing the fuel in dry gas with which the cladding is compatible.

Background

This explanation is immensely important for what will follow later; but first of all we need a little potted history.

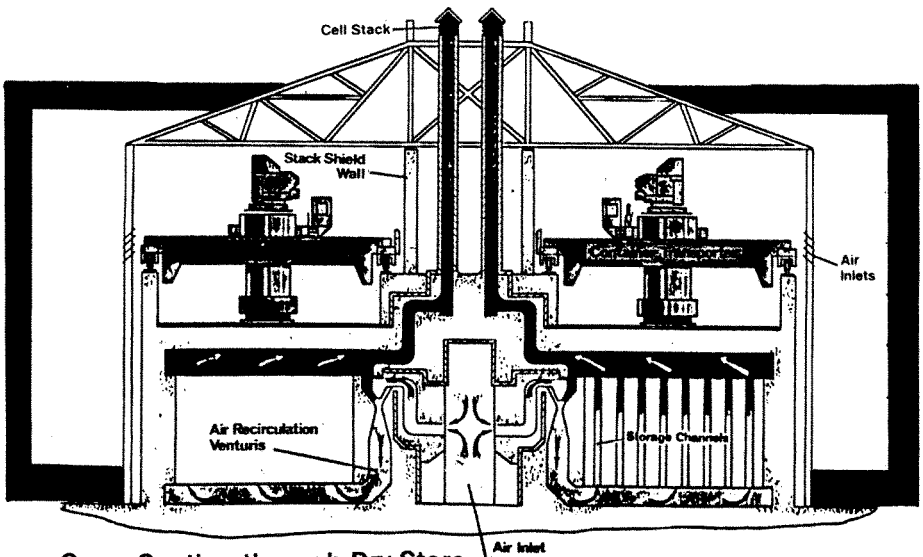
When, after Heseltine's programme in 1979, the anti-High Level Waste (HLW) borehole campaign took off it was not long before we started to advocate the alternative of storage. Inevitably we extended the idea to spent fuel, with the objective of eliminating reprocessing; and, later still, to all forms of radioactive waste.

What we did not know in 1979 was that, at around the same time, the nuclear industry had reached the same conclusion regarding HLW and spent fuel and was about to spend millions of pounds developing it. This they have now done and it forms the main theme of this article.

And yet, as recently as the Torness railhead Inquiry a year ago, and despite persistent coat-trailing about it by objectors including myself, nothing whatever was said about it. The SSEB story was still that the oxide fuel had to be transported to Windscale 'for reprocessing' in a plant which does not even exist. Not a word was said about an alternative which was within sight of going into production.

NNC Design

The first proposal to come my way (there will be others) is from the National Nuclear Corporation. The glossy brochure leaves no doubt that this is a fully researched and engineered design which, though capable of modification, could be produced virtually at once for sale at home or abroad for installation either on an existing nuclear site or at a central location serving more than one.



Cross Section through Dry Store

It takes the form of an air-cooled dry store in which encapsulated spent fuel (Magnox, AGR or PWR) or vitrified HLW can be stored indefinitely under retrievable conditions. This is an extension: the design was originally undertaken for the CEGB with AGR fuel in mind and the original specification required the storage of such fuel from 14 AGR's, each of 625 MWe, located at 6 sites up to 700 Km apart. (An interesting remit when considered against the background of the current infatuation with the PWR as the answer to all problems.)

The plant consists of two sections. Firstly there is a head-end which receives fuel assemblies from storage ponds, dries them and seals them in low-carbon steel containers of standard dimensions capable of receiving any design of fuel assembly. Secondly there is the storage area, constructed of concrete. This part of the design is modular, thus permitting additional storage vaults to be added from time to time without disturbance to the operation of the plant as a whole.

Certain technical doubts arise at this point. PWR fuel pins are clad in Zircaloy which is only a little over ½-mm thick; they are also pressurised with helium. They will have been stored for 5 years under water by the time they are dried and sealed. Over a storage period of 50-100 years, which is what is envisaged, it is only reasonable to anticipate pinhole or crack-leakage from the fuel into the steel containment which, if the latter retains its integrity, should not matter.

More worrying is the fact that it is not proposed to remove the external graphite casing from AGR fuel assemblies. This too will have been stored under water, for 100 days. If it is not totally dried out before sealing the residual water will slowly decompose into hydrogen and oxygen which will accumulate within the steel container. Graphite has produced its share of technical headaches within the industry; possibly this problem of total dry-out can be solved but explicit assurances would be needed.

Air-cooling Unacceptable

But it is when we come to consider the air-cooling system proposed for the storage vaults that fundamental objections arise. The containers are to be cooled by simple intake from the atmo-

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 is 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 radioactivity 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 one 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

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

was controversial. It marked the fourth stage in the South of Scotland Electricity Board's (SSEB) piecemeal approach to nuclear power station construction at Torness. The station was given the go-ahead in 1975, after a seven days public inquiry in 1974. Two subsequent inquiries were held into which route the pylons should take, in 1982 and 1984. Only the details of the routes were allowed to be examined; not the question of whether there should be a route, or a power station for that matter.

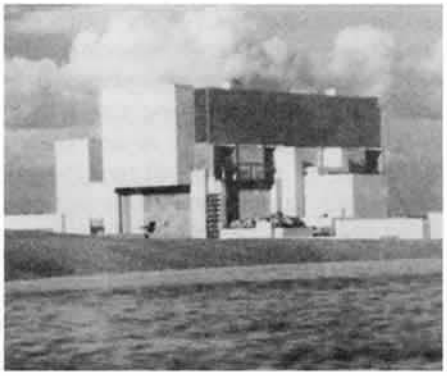
The Reporter at the second inquiry recommended further investigation as there were environmental disadvantages of both the proposed routes, but Mr Younger called time, considering that further discussion would be an expensive and wasteful operation. The route went ahead despite local authority antipathy and the fact it was the SSEB's second choice, and more expensive to boot.

Application Rejected

The fourth stage began on December 16 1983. The SSEB applied for planning permission for 'the erection of a railhead facility at Skateraw, Dunbar'; no more, no less. The Planning Authority requested further information. The relevant Council Departments reported and, on February 28, the Planning Committee of East Lothian District Council rejected the application 'in the interest of public safety'. The SSEB appealed and the Public Local Planning Inquiry was called under the Town and Country Planning (Scotland) Act 1972.

October 23 was suggested as the most suitable date for the inquiry to start. Objectors complained that this would not allow sufficient time to prepare a case and requested at least one month's delay. Written confirmation of the October starting date was received on August 16. Further requests for postponement extracted the final decree on September 19; October 23 it would be.

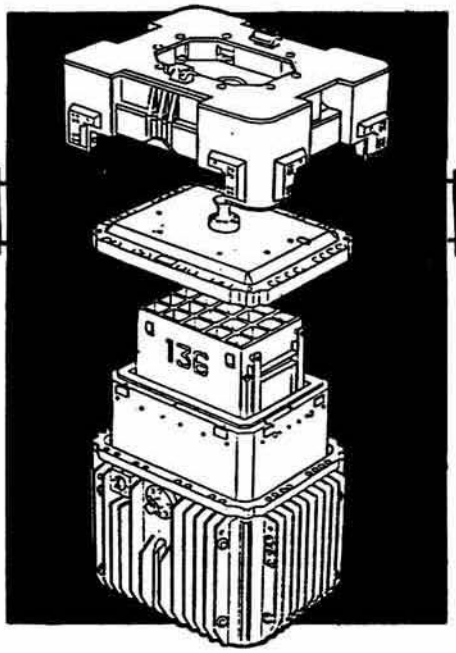
However, the timing of the inquiry was a minor complaint compared to the term of reference. The inquiry's remit was specified as being that 'concerned only with normal land-use planning aspects together with the safety aspects of a) the movement of material by road between the generating station and proposed railhead, and b) the handling of such material at the railhead' (no mention of the word nuclear, re-affirming the Scottish Office's pretence that this was a simple planning application). Discussion of AGR fuel flask design, national spent fuel transport policy and the consequences of an accident in transit were not allowed, although to 'expedite the inquiry' the Reporter heard evidence outwith the remit but did not include it in his 'Findings of Fact'.



JOHN WILSON

Local Inquiry Inappropriate

In a clear message to Dounreay objectors the Reporter, Mr Maycock, expressed the opinion that 'the planning authority. . . misdirected themselves as to the proper purpose and remit of the inquiry' and concluded that the issues the objectors raised 'are not matters which come within the orbit of the planning legislation'. He suggested that these issues 'ought properly to be pursued through other channels and not through *a local planning process* (emphasis added). This is precisely the point we have been making to the Scottish Secretary with reference to the forthcoming Dounreay inquiry; and it is precisely the reason why he hopes to be able to examine that application under the local planning process.



Mr Maycock decided that, as Torness was being built, there had to be a railhead (as the Reporters at the pylons inquiries had stated before him). This piecemeal approach and the 'fait accompli' nature of nuclear power station construction was significant in the Cornwall County Council's opposition (eventually successful) to the Central Electricity Generating Board's proposal for a nuclear power station at Luxulyan in 1981. The same would go for the granting of outline planning permission for the Dounreay facility - a future application for a fast reactor could be granted because we already have the necessary reprocessing plant in this country.

Reporter Overruled

However, as an additional safety precaution and to lessen the impact on the environment, Mr Maycock suggested that the siding should be re-aligned at a wider angle from the main line and there should be some form of physical screening. He recommended that this should be a condition imposed on the planning permission. Mr Younger decided that the danger was exaggerated and overruled his Reporter, requiring of the SSEB that they only undertake tree planting at the site to soften the visual impact.

Maycock also called for training and exercising of the emergency services who would be involved in any incident at the Torness railhead. Mr Younger again overruled him, and ignored a communication sent by the Fire Brigades Union (FBU). The FBU wrote of their total dissatisfaction with the safety arguments which appeared in part 1 of the Report. They expressed their serious concern at the lack of thought which had been exhibited in relation to firefighters' safety. Mr Younger decided that these matters were not appropriate to planning legislation and instead referred them to the SSEB for inclusion in the Fuel Flask Emergency Plan.

The dismissal by the Scottish Secretary of their reservations has prompted the FBU to write an urgent letter of objection to the Dounreay proposal demanding a full Planning Inquiry Commission - along the lines laid out in SCRAM 49 - as the only inquiry which can fully examine the application.

The emphasis placed on the remit aspect of the railhead inquiry, together with the manner in which the decision was 'slipped out', has important implications for the Dounreay inquiry. The Reporter's comments on the remit clearly shows what is in store for the objectors at a Public Local Planning Inquiry. This reinforces our opinion that only a Joint Planning Inquiry Commission is appropriate for examination of a proposal as complex as the one for Dounreay. We will not accept another sham like the 100 days spent at Windscale in 1977.

Public Inquiries: A Review

Sizewell Report: a new approach for major public inquiries by Jennifer Armstrong, (Town and Country Planning Association, £6.95 + £1.25 p & p, 149pp and Apps), A Review of the EEC Directive on Environmental Impact Assessment (EIA) by R. G. H. Turnbull and P. Aitken, (Planning Exchange Briefing Note 7, The Planning Exchange, Glasgow, £4.50, 55pp and Bib)

The 'Sizewell Report' presents a readable and informative account of the inadequacies of the public inquiry into the proposed construction of a PWR at Sizewell. The results of a questionnaire survey of the objectors to the plans reveal:

- inconsistencies in the official position before and during the inquiry with regard to its remit and to the proper forum for deciding on national energy policy
- differences in the treatment of various objectors
- logistic and personal difficulties caused by the inquiry procedures, particularly by its legalistic format
- and the problems faced by inadequately funded objectors

The report makes a number of recommendations for what it calls 'a revised framework - an extra-statutory process - for use in connection with certain proposals of major and national significance.' The recommendations are principally:

- in place of a single Inspector (Reporter in Scotland), to have a panel of Inspectors supported by their own legal and technical team. The witnesses for both sides would not employ their own lawyers
- the panel should have powers to commission their own research, to obtain information, and to invite witnesses on their own initiative
- evidence on Government policy should be admissable and the presence of Government witnesses to present the evidence should be enforceable

I was surprised that the report did not examine more fully the law regarding Planning Inquiry Commissions which with very little modification would encompass all the recommendations; reference was not made to two discussion documents on the issue.(1, 2) I am unhappy that the relationship between this recommended 'extra-statutory process' and the existing law was not discussed.

The Planning Exchange document reviews the background to the EEC Directive on Environmental Impact Assessment (EIA) and the political developments surrounding the passage of the Directive through its various drafts. As normal, Britain differed from the other EEC countries. The second part of the document contains an explanation and evaluation of the contents of the Directive, comparing it with existing UK Planning Law and discussing the questions which it leaves open.

Whilst nuclear power plants and radioactive waste disposal facilities will be subject to mandatory and full EIA's within three years, the use of EIA's to assess planning applications for uranium mining, nuclear fuel enrichment and fabrication plants, and nuclear reprocessing plants will be discretionary. The criteria to be used - to determine whether the latter group should be subject to an EIA, and if they are to be so, how rigorous the examination should be - remain to be decided. Complete with a copy of the Directive and a large bibliography, this is a useful reference document to have at hand for future planning applications. We shall look forward to a similar assessment of the implementation of this Directive in British planning law.

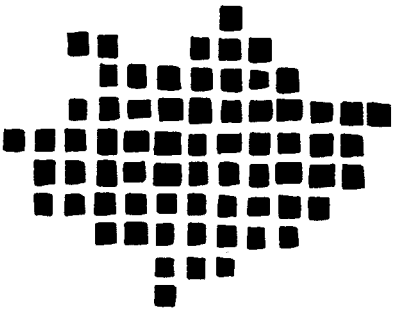
Ian Leveson

References

1 & 2 Lynne Edwards and Jeremy Rowan-Robinson 1979
'What Ever Happened to the Planning Inquiry Commission?' Energy Panel of the Social Science Research Council, Discussion Paper 79-04, University of Aberdeen, Mimeograph, 15pp and Bib.

Lynne Edwards 1980
'Radioactive Waste Burial - A Case Study of the Ayr Public Inquiry', Energy Panel of the Social Science Research Council, Discussion Paper 80-08, University of Aberdeen, Mimeograph, 39pp, Apps. and Bib.

Energy Network



Susie Parsons, Development Manager for the London Energy and Employment Network (LEEN) describes the efforts of this unique organisation to end the misery of cold conditions and high fuel bills suffered by thousands of Londoners each winter and to generate much needed employment in the process.

Investment in the efficient use of energy is an important alternative to investment in new power stations. Research by the Greater London Council (GLC) has shown that a programme of energy conservation in London's housing stock could produce a rate of return over twice that estimated by the Central Electricity Generating Board for Sizewell B. And such a programme would both significantly reduce fuel poverty and provide work for the construction industry.

The London Energy and Employment Network was established in 1983 by the Greater London Enterprise Board, the job-creating arm of the GLC. LEEN aims to

* promote the rational and economic use of energy in London's homes, workplaces and public buildings;

* stimulate employment in London by generating jobs through energy efficiency in the manufacture of new energy saving products, the installation of energy conservation measures in buildings and the provision of energy advice services;

* help to meet the needs of Londoners for low-cost, effective heating; and

* secure investment in energy efficiency.

LEEN has a wide range of member organisations including local authorites, community groups, trade union organisations, local enterprises and tenants associations. We work with these groups to develop new energy saving products, to provide energy efficiency services which meet their needs, and to encourage local authorities to adopt positive energy efficiency policies.

ENERGY EFFICIENCY SERVICES

The range of services we offer to Londoners includes

* the Tenants Heating and Insulation Service which provides private sector finance for improvements to heating and insulation in local authority housing

* the Heatplanner computer programme which enables local authorities to assess the costs and benefits of heating and insulation improvements in the housing stock, and to plan the most cost-effective investment programme

* the Tenants Energy Advice Service which provides free advice and support to tenants groups campaigning for better heating conditions

* the first Draughtproofing Training Centre in the country where workers from energy projects, co-operatives and other small businesses and direct labour organisations can learn the latest techniques

* the Industrial and Commercial Energy Savings Service, including energy surveys, supervision of improvements and advice on the design of new buildings

Policy and Practice

LEEN is currently working with the London Boroughs of Hackney and Islington to help establish comprehensive, co-ordinated energy efficiency policies and practice. A Conference in the summer of 1984 brought together local authority and community representatives to plan the strategy for winning Hackney's Cold War. A number of practical initiatives have flowed from this, including a 24 hour Emergency Coldline telephone service to provide an instant response to people at risk of hypothermia, a Heating Advice Project managed by LEEN for Hackney to maximise the take-up of heating benefits, and increased energy awareness among the Council's housing and technical staff. The Council has adopted a Right to Warmth policy statement and appointed a senior officer to ensure its implementation.

LEEN

In Islington a Right to Warmth Conference was held in the summer of 1984 as part of the Borough's Energy Week. Speakers at the Conference described the measures which could be taken including campaigning for a government policy geared to provide adequate heating benefits and the guarantee of a supply of fuel at reasonable cost; tenant campaigns for improvements to heating and insulation; energy-efficient rehabilitation programmes; careful monitoring of energy use and harnessing renewable energy sources such as the sun and wind. A steering-group was set up from the Conference to take forward the ideas, consult widely with tenants and make both policy and immediate, practical recommendations to the Council

LEEN intends to work on similar lines with other London Boroughs and to produce a London Energy Action Plan during 1986, building on these local initiatives. Stan Orme, Labour Party spokesperson on Energy said during Islington Energy Week: 'The work of the GLC-backed London Energy and Employment Network with London Boroughs, highlighting the

'ENERGY IN THE 80's' PUBLICATIONS

LEEN has recently launched the 'Energy in the 80's' series of publications to ensure the dissemination of new ideas and good practice. Titles in this series include

* Energy Efficiency in Small Laundries and Laundrettes

* The Recyclers Guide to Greater London

* The Draughtproofing Handbook

* Lea View - Low Energy (energy efficient housing rehabilitation)

* District Heating - Tackling the Problems

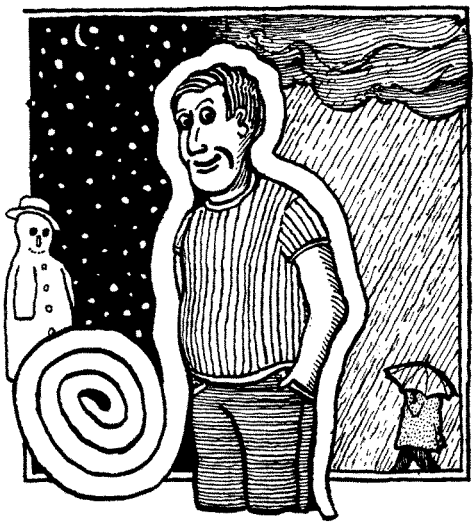
* Hard to Heat (explains how to get extra money for social security claimants).

need for energy saving and the ways to achieve it must not only be congratulated and endorsed but wholeheartedly supported by central Government.'

LEEN hopes that the practical results achieved in London Boroughs will convince central government of the need for investment. Only with an infusion of local and central government and private capital to finance large-scale practical energy conservation work will the UK have a more rational energy policy.

New Energy Saving Products

One product - a steam engine for combined heat and power applications



in the Third World and installation in boats in the UK - has already been put on to the market with assistance from LEEN. Products to be put into production over the next year include a low-cost data logger, a cheap domestic heat pump and a user-friendly heating controller. And LEEN has a rolling programme for the assessment and development of new product ideas. In our well-equipped Workshop good ideas can get off the drawing-board and into testing and production.

LEEN works only in London, but Susie told SCRAM that they are willing to make their experience available to people and organisations outside London. Telelphone her on (01) 387 4393 for more information about LEEN activities.

Tidal Power on Uist

A cautious step has been taken to reintroduce a form of renewable energy which first arrived here with Julius Caesar and was subsequently declared to be obsolete.

Tidal power is on the way back. Not the 7,200 megawatt Severn barrage for which Professor Eric Wilson argued at the Sizewell Inquiry but a more modest device which he has invented. It will be rated at 270 kilowatts and will be stretched across the narrows where Loch Houram empties into the sea on the island of North Uist.

The size of the project is emphasised not to belittle the Professor and his colleagues, who have produced a revolutionary device with great potential; but to make plain that there has been no repentance by a Government determined to confine the alternatives to a subordinate role. The entire cost of the Uist project is £700,000 and half of this is coming from private sources and, of the rest, the biggest contributor is the EEC which is providing £204,000. Mr Walker's Department of Energy and Mr Tebbit's Department of Trade and Industry are donating the cost of, say, a perimeter fence round a reprocessing plant.

The significance of the Wilson plan for Uist is that it is, if successful, pointing the way to development in the Third World in an area previously inaccessible. He has devised a barrage which does not require turbines and can, therefore, be used in rivers and particularly, in irrigation canals where there is not a high head of water. Professor Wilson told me:

In the Punjab, there are more than 200 sites which we have identified in a survey where the water falls between one and three metres. With our device, all of them can be developed.

But turbines effectively start only at three metres and are prohibitively expensive below that. We can utilise water power which is normally dissipated.

The device is called a Salford Transverse Oscillator (STO) because Professor Wilson and his collaborator, Dr G. N. Bullock, are employed in the Civil Engineering Department of Salford University; and because it oscillates backwards and forwards across the tidal flow.

The water pressure forces gates to swing from side to side, opening the way for water to flow from the higher level to the lower, driving paddles as it goes, activating a hydraulic ram and pumping pressurised hydraulic fluid (oil) into a generator. Essentially, it means that a low head of water can be used in a hydraulic transformer, converting potential energy into a high-pressure flow of fluid. With such devices, the irrigation canals which glide across the brown plains of hot countries, losing height in small steps, can be brought into service as fuel for a power station.

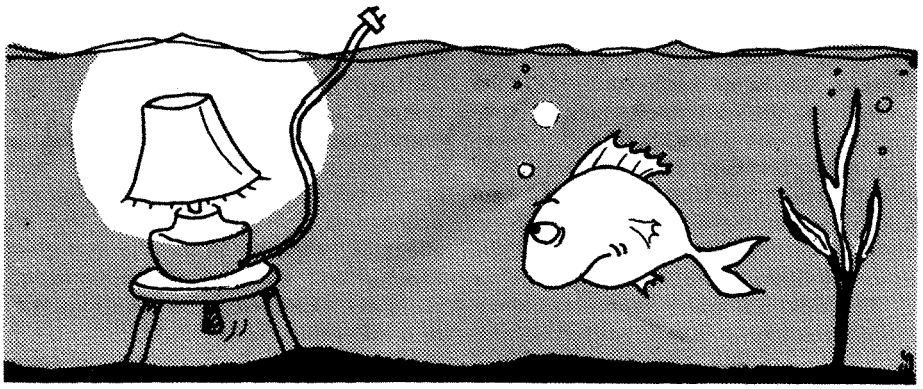
And in Uist it will provide power for a geriatric hospital. This is provided normally by burning diesel oil at a cost of around 16p-17p a unit. (The consumers pay the same price, roughly 5p, as is charged on the mainland and the rest of us subsidise them to make up the difference.) With the STO, the cost of a unit will be about 7p. The hospital will be charged 4p, giving it electricity for less than it has paid until now, and the other 3p will come from grants.

The question of cost is uppermost in the minds of our own energy establishment but it is being regarded more philosophically by James Howden, the Glasgow engineering firm which is successfully manufacturing and exporting to California its wind machines and is building and marketing the STO, and by Professor Wilson. "This is a prototype," he said. "If you were building one in an Indian canal with cheaper labour, and you worked in the dry, then the cost comes out much nearer 1p a unit. Also, the costing depends on usage. There is 25% utilisation in tidal plant like Uist but 80% utilisation with a river."

The role of the North of Scotland Hydro-Electric Board has been significant. It has provided free technical advice particularly on connecting the barrage to the hospital. It has promised to supply a switching system at no charge, and interconnections and metering. And it has agreed to buy any surplus electricity.

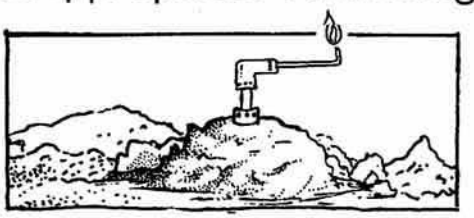
In a world arguing the demerits of acid rain and radiation, the STO shines out brightly, if only because of its loneliness.

David Ross



EVA SCHONVELD

Appropriate Technology



A £500,000 scheme is to be commissioned early in the new year to exploit waste gas produced at the Bidston landfill site in the Wirral on Merseyside. National Smokeless Fuels (NSF) and Merseyside County Council, with the ICB Leasing finance company, have set up a joint company to sell the gas. NSF will design and commission the collection and delivery network and the gas will be piped to the Cadbury Typhoo Factory just over a mile away where it will be used as a prime boiler fuel.

The Energy Efficiency Demonstration Scheme will provide £133,000 of funding and the project should take three months to complete and is expected to last ten years.

Energy Manager, September 1985

Wind

JOHN WILSON

The South of Scotland Electricity Board (SSEB) has increased its aerogenerator capacity by 400%: they have added a 60kW machine to their previously sole example of this technology, a 15kW machine at the West of Scotland Agricultural College at Auchincruive near Prestwick in Ayrshire.

The machine at Auchincruive has been operating for some time and was designed and built by International Research and Development Co. Ltd. (a subsidiary of Northern Engineering Industries). It stands 12 metres high and has an 8 metre diameter three-bladed rotor. Under optimum conditions it is expected that this machine could produce an output of about 30,000 units annually, about a third of the electrical demand of an 'average small farm'.

The new machine (see photo), which has not yet been commissioned, was designed and installed by James Howden and Co. of Glasgow. It is a 60kW machine and is mounted on a 20m high tower. The three-bladed rotor is 15m in diameter. SSEB estimates suggest that one third of the electricity demand of a 'large farm' could be provided by this aerogenerator: 100,000 units of 300,000.

Initial indications suggest that there are 100 small farms and a dozen large

farms in the SSEB area which could usefully operate one or other of the machines. The data assessment period is expected to take between two and five years. **East Lothian Courier, 27.9.85**

The authorities which control energy production and use must undergo a change of heart if we are to achieve improved energy systems in this country. This was the main assertion made by Dr John Twidell, head of Strathclyde University's Energy Studies Unit, at the British Association for the Advancement of Science annual meeting in Glasgow at the beginning of September.

Dr Twidell claimed that there is no world energy shortage; the problem is the *quality* of the energy supply, not the *quantity*. Improved energy systems could be developed if the 'quality of demand' was better matched to the 'quality of supply'. This would encourage the greater use of heat pumps, remote switching for load control, heat recovery, wind generators in rural areas, etc.

He pinpointed a number of institutional blocks to improved energy systems: low commitment to energy efficiency improvements; lack of practical commitment to CHP; poor commitment to practical demonstrations of alternative energy supplies; and inadequate presentation of energy statistics. The Government approach to consideration of only centralised energy systems has adversely affected new product development and export market exploitation, Dr Twidell observed.

German experience was much better: both heat and work is considered in energy planning; passive solar heating and other novel systems are exploited; and the quality of energy is quantified for various uses. In the Third World emphasis should be placed on the use of indigenous supplies, such as biofuels, solar and hydro instead of attempting to transfer industrialised technologies.

Dr Twidell concluded that there is no fundamental energy shortage anywhere in the world but 'there is a lack of harnessing local supplies and using energy in efficient and suitable installations'. **Electrical Review, 6/13.9.85**

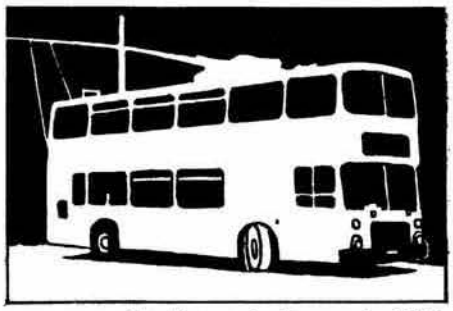
Transport

The South Yorkshire Transport Executive is to begin a two year trial of a prototype trolley-bus on a 1.5km test track next to the Doncaster racecourse. They believe that fuel cost increases and electric drive technology advances have increased the economic viability of the electrically-driven trolley-buses. A consortium including the Transport Executive, GEC Transportation Projects, Balfour Beatty Power Construction and Insul 8 has invested more than £300,000 developing the prototype and erecting the overhead lines.

The West Yorkshire Transport Executive is planning a 39km trolley-bus network in Leeds, and is proceeding without trials. If the Government provides half of the £10 million estimated cost the Leeds system could be operational by next May. The scheme will take three years to complete and will include 34 trolley-buses, each capable of carrying 80 passengers.

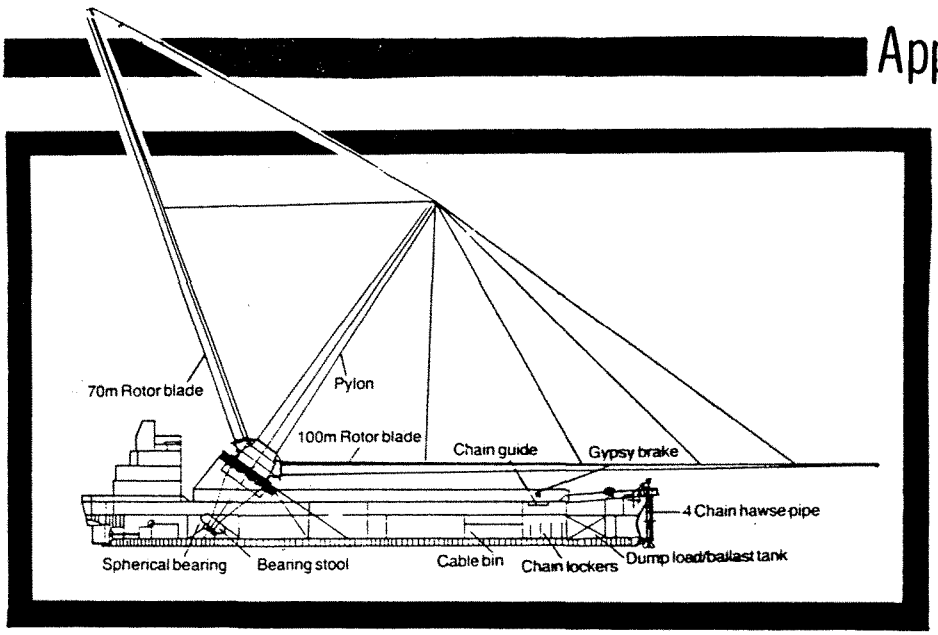
There could be advantages in this systems for both passengers and operators. There will be less noise, vibration and fumes and the ride will be more comfortable. The operators will gain in economies; the motor should last for about 30 years, twice as long as a diesel engine, and running and maintenance costs are expected to be about one third of diesel vehicles.

Schemes in Rotherham, Doncaster and Bradford could follow. A network



was opened in Nancy in France in 1982, followed by one in Warsaw a year later. The Belgian town of Ghent is also about to introduce a trolley-bus system. The last trolley-bus to run in Britain was in 1972, in Bradford.

Electrical Review 23/30.8.85



In SCRAM 38 (October 1983) we carried a story about a new design of wind power generator developed by a German engineer, Dr Wagner. The machines were designed to be sited in estuaries mounted on ships moored offshore. The idea was taken up by British Shipbuilders on the Tyne following the SCRAM piece.

The project has now developed and although there is no more funding from British Shipbuilders there is hope that the Energy Technology Support Unit (ETSU) of Harwell may come up with something.

Wind energy is already more economical than either coal or nuclear generating plant and technical advances should increase the advantage in the future. It is also well matched to demand: in the UK there is generally more wind in the winter peak demand period; and in California increased winds on hot days are ideal for air conditioning load. Also, a Californian Energy Commission study found wind power was costing 8 to 9 cents/kWh compared with 15 to 19 c/kWh for nuclear. It seems an ideal energy source for island communities which, until now, relied on deisel power.

Ship mounted wind machines have several advantages. The whole system can be built in a shipyard using conventional equipment, proceed to site under its own power, drop anchors and even lay its own cables. The vessel could accomodate commissioning and maintenance teams on board and startup and emergency power can be provided by the ship's engine. Also wind over water is generally stronger than that over land.

The British Shipbuilders study was for a German shipowner and looked at conversion of a 3000 tonne ship to take a 4MW machine. The output voltage is limited to about 3.3kV with present technology and transformers are required onshore. The wind turbine itself is an inclined axis type - an intermediate solution as both the vertical and horizontal axis types have disadvantages. The main rotor blade is 100m long and the smaller counterbalance blade is 70m long.

The provisional quotation for the conversion work was $3.6 million and the complete installation and delivery cost could be $5.4m. Although very competitive, it was still a rough prototype and hence a little too expensive to speculate on. Therefore a 100kW prototype has been designed. This would be placed on a 200t barge and was so designed as to fit into a standard shipping container for export. The twin blades are 15m long but can be converted to 20m for low wind speed sites. Simplicity and reliability interests demanded the omission of pitch variation and braking mechanisms, so control is achieved by tongue management adjusted electronically with wind speed.

The study identified a niche for such a system, and it is possible that this design could be scaled up to machines of well above 10MW. There is a particular advantage for island communities in that the ship's diesel engine could serve as back-up and the empty hull could be used for desalination plant, energy storage electrolytic process equipment. Rough water sites, such as the North Sea, could also be exploited to collect wave energy and send it ashore along the same submarine cable as the wind energy.

Modern Power Systems, August 1985

Thrifty

PAM Electrics, a small Ulster company, has developed a solid state timer for immersion heaters. The heater can be switched on for any period between 1½ minutes and 2½ hours. It has taken 2 years and £25,000 of grants to develop, and the circuitry has been miniaturised to fit into a standard switch box.

The 'Thrift Switch' costs about £20 but the savings in fuel bills are likely to be high since many consumers often forget to switch off their heater after use.

Electrical Review 6/13.9.85

Inexcusable

New Building Regulations due to come into force in November have been strongly criticised by the Structural Insulation Association. The Regulations omit any mandatory standard for the insulation of ground floors of new buildings, and the Association finds this inexcusable.

Energy Manager, September 1985

Blotted

British Nuclear Fuels has a new home for engineering design - Hinton House. The design objective of the complex was that of a low energy building providing a comfortable working environment for its 1850 staff.

The window area has been maximised to reduce artificial lighting load, and double glazed to reduce heat loss. Polyurethene insulation boards have been applied to the exterior office walls.

However, they've blotted their copy books by using four 1.1MW electrode boilers fuelled by *off-peak electricity* to heat the building. Better luck next time!

Energy Manager, September 1985

Local Energy

Rural energy development efforts are being redoubled in China. The supply of commercial energy is much lower than demand so the State is encouraging local energy resources development and their more efficient use.

Peasants have pooled their resources to build small-scale hydro schemes and over 16,000 small coal mines have been opened. These are new shallow open cast mines and old mines where coal still can be recovered (uneconomic pits?) Annual output of these mines has increased from 110 million tonnes in 1980 to 160mt in 1983.

A wood burning stove with a 25% thermal efficiency is popular among more than 18 million peasants, which is saving about 4.5mt of coal. Biogas also plays a role: 1000 million cubic metres of biogas can be produced annually from 3¼ million digesters. Another 5 million are planned by 1990.

Modern Power Systems, August 1985

Safeguarding the Bomb: A Review of the Non Proliferation Treaty by Jos Gallacher (SCRAM, 60p, 18pp)

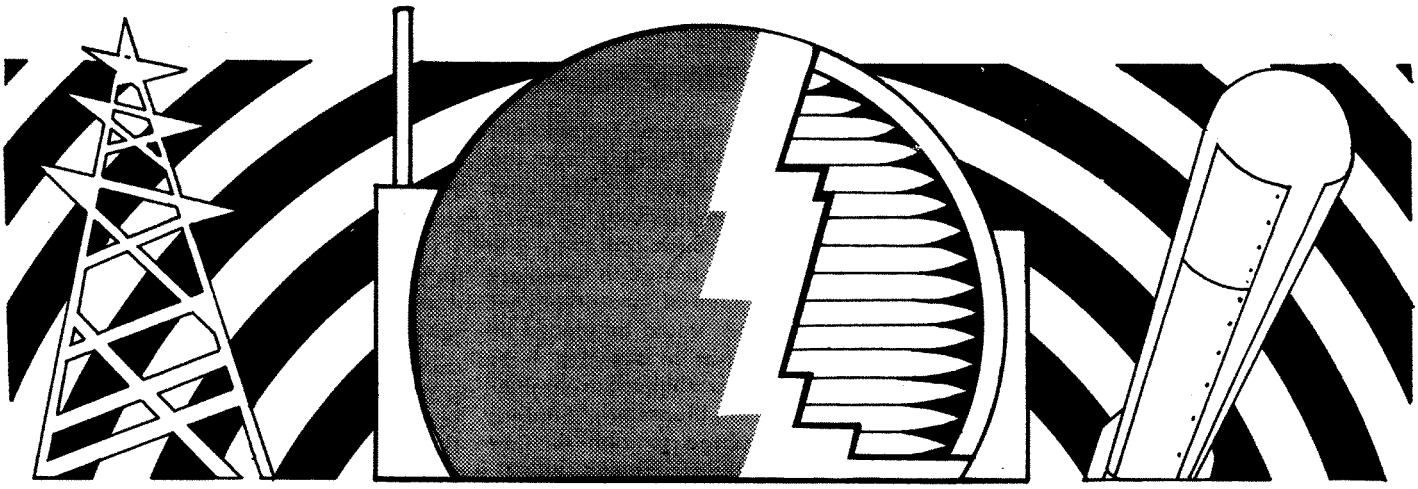
Anyone wanting a short, sharp, expert but readable account of the vital issues surrounding the Nuclear Non-Proliferation Treaty (NPT) would be well advised to turn to Jos Gallacher's pamphlet.

In the context of the five yearly NPT review conference which took place in Geneva in September, he carefully dissects the treaty's flaws, condemning outright its enthusiastic support for nuclear power - something too few people are prepared to do. But at the same time he recognises the crucial importance of preserving most of the treaty as one of the world's only barriers to nuclear mayhem.

He is particularly critical of the nuclear weapons states' failure to uphold Article VI which commits them to negotiate 'in good faith on effective measures relating to the cessation of the nuclear arms race at an early date, and to nuclear disarmament'. He points out that the least they could do to show the 'good faith' required would be to agree to halt nuclear testing.

He concludes by advocating a freeze on the production of all fissile material, so-called civil and military. This notion has only come to prominence fairly recently and I think its potential strength as a tactical demand has yet to be fully appreciated.

Rob Edwards



The Deadly Connection: Nuclear Power, Nuclear Weapons by Rob Edwards (CND Publications, 95p 32pp)

In this pamphlet Rob Edwards returns to his familiar argument that 'nuclear power and nuclear weapons are like Siamese twins, conceived together, joined at birth and now inseparable.' The author co-ordinated the presentation of CND's evidence to the Sizewell Inquiry and this pamphlet updates an earlier work of his, *The Plutonium Connection: Sizewell B and the Bomb*, which outlined CND's case.

The pamphlet is divided into four parts. Part One describes the development of Britain's nuclear programme and is little different from the earlier pamphlet. Part Two is concerned with Horizontal Proliferation - the spread of nuclear weapons to more countries - and Part Three with Vertical Proliferation - the expansion of existing nuclear arsenals, particularly Britain's. Part Four concludes that a world free of nuclear weapons must also be free of nuclear power and calls for changes in the Nuclear Non-Proliferation Treaty (NPT) to remove its incentives to civil nuclear trade.

The new pamphlet greatly improves on its predecessor, not least because it no longer attempts to argue the improbable case that Sizewell's PWR would be incorporated into a military fuel cycle. (It would be far more expensive and inconvenient to produce weapons quality plutonium from a PWR than from either Magnox or Fast Breeder Reactors. Even AGR's with on-load refuelling are more easily militarised than PWR's.)

The core of the pamphlet is Part Three, which presents the evidence for believing that plutonium produced in Britain's civil Magnox reactors has entered the Amercian stockpile of weapons plutonium; some may already be in American warheads. This argument appeared in the earlier pamphlet but here it is supported by much new evidence compiled in the preparation of CND's Sizewell case or extracted at the Inquiry. In this respect *The Deadly Connection* is a useful report on the results of CND's decision to intervene in the Inquiry.

In my view the most serious aspect of the nuclear connection is the problem of horizontal proliferation. The pamphlet surpasses its predecessor in the increased attention given to this facet of the question. Once again, however, Sizewell provides a focus with the suggestion that the American firm Westinghouse wishes to use Britain as a shop front to sell its PWR's while evading strict US anti-proliferation laws.

The nuclear industry tends to discuss non-proliferation in terms of 'safeguards' and so to underplay the total political environment of proliferation in which safeguards form only one small technical component. In confronting the nuclear industry this inverted viewpoint has often been adopted by the opposition. This pamphlet follows the pattern. While it is clear that the author understands that safeguards have meaning only in terms of the agreements they verify, the balance of the pamphlet leaves the reader with the impression that safeguards are important to non-proliferation as the NPT.

In discussing the NPT the pamphlet exposes another ambivalence in the anti-nuclear position. The Treaty is both condemned as 'ineffective', 'the NPT has not prevented proliferation', (p13), but defended as essential:- 'It is one of the world's only barriers to nuclear mayhem.'(p26) While the roots of this contradiction lie in the NPT itself, the anti-nuclear movement must make up its mind. I believe the NPT has been effective but could be made more so if the promotion of nuclear trade was excised and the clause requiring nuclear disarmament implemented.

Each of the three topics covered in the pamphlet - horizontal proliferation, vertical proliferation, and the NPT, deserves a pamphlet on its own to do it justice. However within the limits of covering such a wide area in a short publication, *The Deadly Connection* provides a wealth of information in a lively and readable style. This pamphlet will serve well as an introduction to the nuclear link or as an update on the integration of Britain's civil nuclear industry into the weapons business.

Jos Gallacher

Conservation and Change: Policy for the Environment. (SDP Policy Document, £1, 45pp)

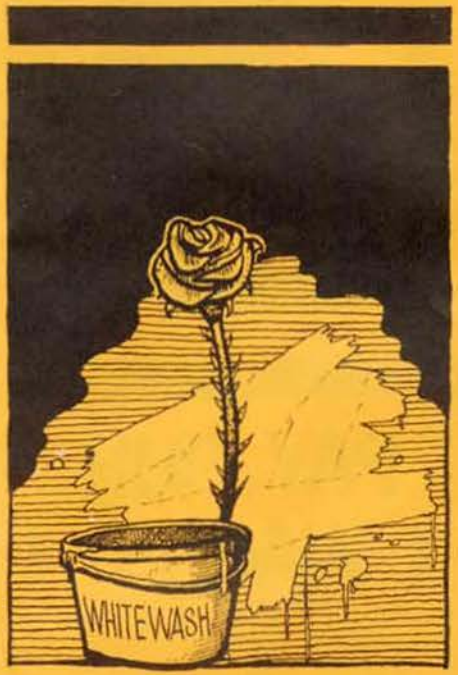
This SDP policy document gets off to a good start by recognising that 'Environmental issues are no longer on the sidelines of public life but in the centre.' It uses lots of nice sounding phrases like 'green growth', which means encouraging economic growth which is environmentally beneficial. The need for open government is also stressed. For agriculture, a more organic approach is proposed, along with an extension of planning controls. The development of renewable energy and combined heat and power, and an energy conservation programme are all proposed, but the document fails to tackle nuclear power:-

> *This is not the place to take a view on the whole question of nuclear power. But we believe that the problem of disposal of nuclear waste is so serious that major and further research is required to ensure the safe disposal of nuclear waste products before there is any major expansion of the existing nuclear power programme.* (my emphasis)

Even this small concession to what is, after all, a major concern of environmentalists, upset Mr George Burness, an SDP member of Highland Regional Council. He said such a policy would mean that the party would have to oppose the Dounreay reprocessing plant and put the nuclear industry into limbo for 30 years. I somehow doubt it.

Although some of these policies would make a big difference if put into effect, one can't help thinking that it is just a cynical attempt to gain a few extra 'green' votes. The green vote could prove decisive in 50 constituencies according to Bill Rodgers who proposed the policy at the conference. This is the man who in 1960 was the organising secretary of the Campaign for Democratic Socialism; which employed full-time organisers to work in Labour Party constituencies and unions all over the country to reverse Labour's commitment to unilateral disarmament. To this day Bill Rodgers has never satisfactorily explained where he got the money from, and quite frankly I don't believe a word he says.

Pete Roche



Handbook of Energy Data and Calculations by Peter D. Osborn (Butterworths, £37.50, 275pp)

An odd book to review in the SCRAM Journal perhaps, but I thought it was well worth a mention. I used to work for an Energy Consultancy carrying out energy audits for commercial premises, and I spent many frustrating hours looking for, or calculating from first principles, the information which is contained in this book. There are lots of useful tables, like heat output from radiators; lots of reasonably easy to understand explanations of things like how to calculate the energy loss through buildings, and how to calculate the value of capacitors required for power factor correction. There is also a directory at the end of companies involved in the energy conservation field.

If you are at all involved in carrying out energy audits, I strongly recommend that you take a look at this book - there is almost certain to be something in it which you will find useful, and you will conserve time as well as energy.

Pete Roche

Death of a Rose Grower by Graham Smith (Cecil Woolf, £2.50, 96pp)

This book does not purport to introduce any new and startling information on the death of Hilda Murrell. What it does do, in a clear and concise manner, is log all the known facts and list all the major theories and speculations.

Each chapter deals with the story from a different viewpoint and the author sits objectively asking questions when they beg to be asked. As will become evident to the reader, the fact that there are a lot of questions and very little in the way of answers is just one thing that sets this murder investigation apart from all the others.

There are many inconsistencies, not least of which are in the theory put forward by the West Mercia Police Constabulary. Space does not permit a list of even a few of them, but try this for a taster.

When issuing a description of a person 'wanted for questioning' you have to be very careful. If it is inaccurate it is useless. Yet from within two days of discovery of the body until three months later *five* different descriptions were issued including two totally different photofit pictures. This was worse than useless. It was confusing and misinformative.

It would be easy to think of this book as an intellectual exercise. It isn't. Hilda Murrell was a real and valuable person who lost her life at the hands of a murderer, motive unknown. Read this book and you will never have quite the same trust in police investigations again.

Boyd Taylor

Listings

Joint Stock
Fire in the Lake
1-5 October. Birmingham
8-19 October. Liverpool
A play about radiation in Cumbria and mining in Africa. Winner of a Fringe First at the Edinburgh Festival.

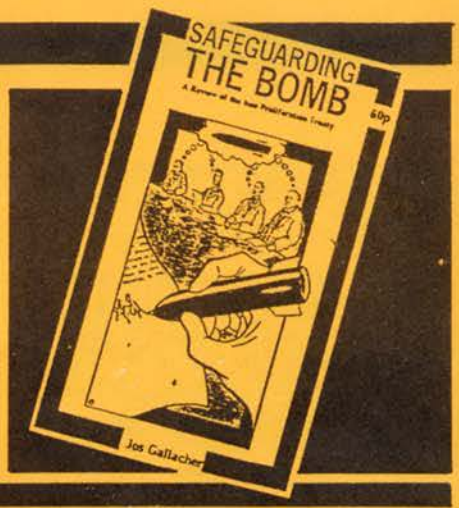
FoE
Friends of the Earth
Annual Conference
19/20 October. London University, Gower Street. Discussions and Campaign, Planning on Energy, Acid Rain, Pesticides, Tropical Rain Forests, Transport and the Countryside.
Contact: FoE Ltd., 377 City Road, London EC1V. Tel: 01 837 0731

CND
Campaign for Nuclear Disarmament
Rally for the Human Race.
26 October. Assemble Serpentine Road, Hyde Park for 11.00.
Contact: CND, 22-24 Underwood Street, London N1 7JG 01. Tel: 250 4010

SCRAM
Event of the Decade
9 November. Moray House, Students Union, Holyrood Road, Edinburgh
Dayschool from 11.00 to 4.30 to discuss campaign strategies.
Party from 8 till late with disco, bands, food and fun!
Ticket for the whole event £5 from SCRAM, 11 Forth Street, Edinburgh. Tel: 031 557 4283

A compilation of a series of articles appearing in SCRAM over the past year, the pamphlet examines the record of the NPT since it came into force in 1970. It particularly looks at the NPT's contradiction of limiting nuclear weapons whilst promoting nuclear power. The failure of the NPT to deliver on nuclear disarmament is also strongly criticised.

Safeguarding the Bomb: A Review of the NPT by Jos Gallacher. A new pamphlet published by SCRAM and available for 60p (+ 18p) from Scram, 11 Forth Street, Edinburgh.



Little Black Rabbit.

Little Black Rabbit was spending time in hospital recently recovering from a mild form of chronic myxomatosis. In the next bed was a CEGB engineer from Heysham A Nuclear power station. During the course of their stay they had a couple of chats. Some very interesting information was provided by the recuperating engineer.

It appears that, during the miners' strike, reactor number one at the station was being operated at 700MW. This is 40MW above the design rating of 660MW for which the station was given planning permission. Being a little sceptical about things one hears in conversations in hospitals (!) Little Black Rabbit checked up with the published data. From after the plant started performing properly in May '84 following power testing, it achieved load factors of about 40% until the autumn when the figures leapt up: December - 89%, January - 75%, February - 93%. The next figures available showed a distinct drop: May - 19%, June - 48%. The drop could be explained by the engineer's revelation that the reactor was shut down for servicing and inspection after the strike.

During the shutdown, the engineer said that modifications were going to be made to the boilers which would permanently upgrade the station's output to the higher figure of 7000MW. Data not yet available to Little Black Rabbit may confirm this. However, certain questions remain. Does the modification change the terms of the site operating licence, and if so did the CEGB receive NII approval?

Another piece of information gleaned from the CEGB engineer was that a 10" fire main ruptured in the main pump house and flooded the 22 foot deep room to within three feet of the pump. The pumps are designed to run continually with only annual maintenance and, if the flooding had not been discovered by chance, then further flooding could have resulted in very costly damage. A failure of the pump, which pumps water to the turbines, could have resulted in a turbine trip, and even a reactor trip.

Heysham does seem to have had a lot of problems in its short, 2 year, operating life.

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