SAFE ENERGY

No.87 February/March 1992 £1.25

Dismantle or entomb

The Hydro: the end of a dream

Dumping Convention

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Ignoring the risks

COMMENT

IN recent years the National Radiological Protection Board (NRPB) has had a relatively easy time from the environment movement. Perhaps this is because 4 years ago they alone were willing to buck the recommendations of the apparently omnipotent International Commission on Radiological Protection (ICRP). Unhappy with the ICRP's lax dose limits, the NRPB pushed for more stringent standards in the UK, costing the nuclear industry a considerable amount of money.

However, one act of bravery, or indeed integrity, cannot shield them from reality forever.

Despite a new ICRP analysis of the A-Bomb survivors data showing that the Commission's dose limits are 4-5 times too high, no reduction has been tabled (see pages 16-17).

It is the NRPB's statutory duty to advise government on ICRP recommendations, however, rather than point out that the ICRP are tailoring radiation protection standards to fit the requirements of the nuclear industry, from which many of its members are drawn, they have dodged the issue altogether. They now claim that dose limits are an issue for the EC, who are formulating a new radiation protection directive under Euratom. It is no coincidence that the directive bears a stunning resemblance to the ICRP recommendations, most of the EC's experts working on Euratom are members of the ICRP.

Further, the NRPB's latest study – the First Analysis of the National Registry for Radiation Workers – not only backs the findings of the ICRP's A-Bomb survivors work, it shows that the ICRP are still out by a factor of 2.

It is once again time that the NRPB spoke out and advised government of the real risks of radiation rather than burying its head in the sand of nuclear industry dominated pseudo science.

The NRPB has published a consultation document on the ICRP's recommendations, it is vital that everyone gets hold of a copy and then lets the NRPB know that P is for protection, not procrastination. What are they trying to protect, the health of radiation workers or the nuclear industry's bank balance?

THE Labour Party have moved a considerable way since their pro-nuclear days. However, unlike all the other opposition parties, they have been unable to make a firm commitment to phase out nuclear power.

Phrases like "our dependence on nuclear power will steadily diminish" look good, but careful reading of policy documents shows serious loopholes; and from their 1990 environment document ***An earthly chance*** to ***Opportunity Britain*** published the following year, their policy, rather than being clarified, has become more vague (see pages 14-15).

Scepticism of Labour's policy is fuelled by the presence of Dr Jack Cunningham (the pro-nuclear MP for the Sellafield area) in the influential role of Campaign Co-ordinator.

If the Labour Party's policy for government is that no new nuclear power stations (apart from Sizewell B) will be built – by the public or private sector – nor the life of existing stations extended, then their manifesto should say so clearly and unequivocally.

The UK Atomic Energy Authority newspaper *AT* stated, in November 1991, that Labour's manifesto will "contain a commitment of gradually phasing out nuclear power by the end of the century". When the election is called, get their manifesto and find out.

SCRAM's *Safe Energy* journal is produced bi-monthly for the British Anti-nuclear and Safe Energy movements by the Scottish Campaign to Resist the Atomic Menace. Views expressed in articles appearing in this journal are not necessarily those of SCRAM.

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to shut-down a nuclear reactor in an emergency.

CONTRIBUTIONS

We welcome contributions of articles, news, letters, graphics and photographs; which should be sent to SCRAM at the address below.

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CORRECTION

The article "Danube dam damned" in the last issue contained two typographical errors on page 11. The area of the dam covers 5 to 6 hectares (not 56) and the new channel will be 12 to 16 metres (not, surprisingly, 1216 metres) above the level of Vojka and other towns. We apologise to Bridget and our readers for the mistake.

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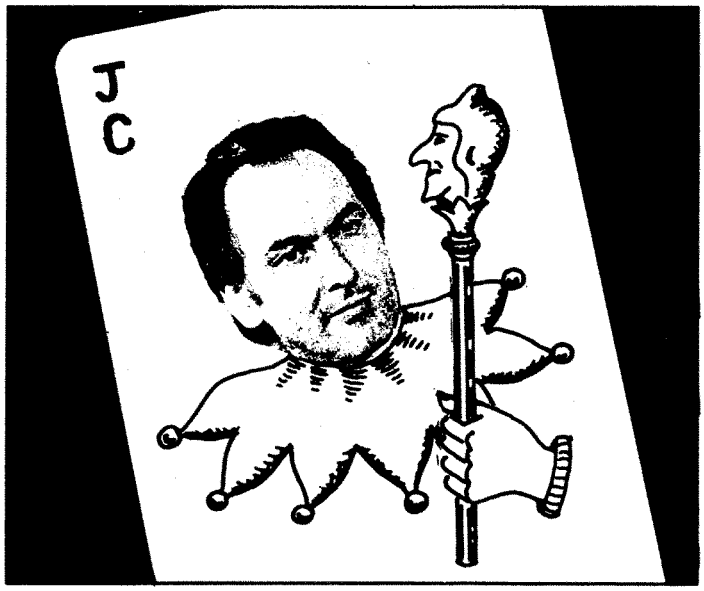
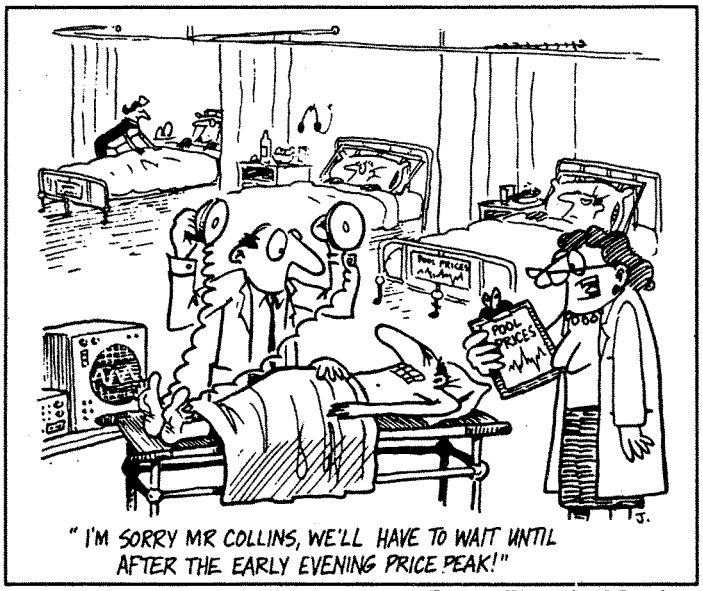




From: *Electrical Review*

Nirex round the bend

TWO bore holes which Nirex hoped to sink in the Lake District National Park, and say are absolutely vital to their safety case, have been rejected by the Lake District Special Board.

The proposed bores for Bleng and Whin Fell, near Gosforth, would have "an unacceptable harmful effect on the landscape and would be out of keeping with this sensitive area of the National Park," said the Chief Planning Officer.

Before the decision was taken, Allan Irving of British Nuclear Fuel's said: "It would be unfortunate if the new applications are turned down because these boreholes would provide vital evidence for the safety case of the repository, and safety is of paramount importance."

The company are now considering alternative approaches, including the possibility of appealing against the decision. Given that "safety is paramount", and the information from these boreholes is "vital ... for the safety case", it would seem that an appeal is the only option if Nirex want to continue with the Sellafield option. A point which is being taken up by the local Conservative prospective parliamentary candidate, Phil Davies: "I will call on Nirex to abandon its proposal. Safety is paramount and is the only consideration."

■ Meanwhile, Nirex, due to 'huge public demand', have adapted the design of their repository. They have abandoned the idea of having 4 shafts descending directly into the caverns below, in favour of the waste being "conveyed to the disposal chambers - half-a-mile underground - via sloping spiral tunnels or *drifts*". Locals objected to the previous design, which would have meant four 150ft towers climbing into the sky, surrounded by 250 acres of surface works, near the Lake District National Park.

Surface works above the dump are restricted to 10 acres and will consist of 2 landscaped ventilations shafts which double up as emergency entrances and escape hatches. The bulk of the works will be on the Sellafield site, from were the automated rack-and-pinion railway will carry the waste containers down the 5 mile long slopes.

Nirex Managing Director Michael Folger's statement that "... we have listened hard to local comments about site access, land take, and the visual impact of our proposals. We believe the preferred design makes good sense for everyone," was greeted with some scepticism. The previous plan involved sinking the widest vertical shafts in the UK, down which loads of up to 60 tonnes would have to be winched about 870ft. Senior BNFL officials were concerned that it lay on the wrong side of the border between fantasy and reality.

Nirex's technical director, Harold Beale, commented that, although the 'drifts' were within current technology, the option of vertical shafts would be maintained in case the geology was unsuitable for the railway.

Nirex are also claiming to have made another concession to public opinion. Retrievability will be achieved by using a grout that can be 'cut with a breadknife' to fix the containers in cement in the caverns before backfilling. Each canister will be labelled, detailing the origin and composition of their radioactive contents. A data base will also be maintained.

Planning permission for the repository will be lodged at the end of this year, if all goes according to plan. However, the house magazine of the United Kingdom Atomic Energy Authority, ***ATOM***, reports: "In the meantime it ... will not make any firm commitment to either Dounreay or Sellafield until it has planning permission, which will be 1995 at the earliest."

High level waste, is not on their agenda. Nirex chair, Richard Morris, said it "is not giving any thought to" HLW. Nor is the rest of the nuclear industry. □

Single European Dump

THE 1993 Single European Market is in danger of becoming a "Single European Dump", say Greenpeace*, where the dictates of 'free trade' could leave some countries holding the nuclear baby.

The group warn that if the EC's executive Commission and its highest tribunal, the Court of Justice, get their way, nuclear waste of all radioactive levels could suddenly "flood any EC or European Free Trade Association (EFTA) where waste facilities exist."

Shortly, the Court will be reviewing a 1987 rule issued by Belgium's regional government in Wallonia preventing the importation of hazardous goods. They are expected to strike it down. Indeed, the Court's Advocate General, has issued advice arguing that the rule is an obstacle to free trade. Wastes, it says, are subject to financial transaction and should therefore be treated as goods.

Hazardous wastes are not "goods" say Greenpeace, and should be exempt: "If hazardous wastes are considered a commodity like apples and oranges, then we'll all be eating it soon. Waste should be seen as a disease to be prevented, not something you would sell to your neighbours."

While no EC country has a fully operating dump, the first to do so "may end up receiving all of Europe's nuclear waste." Sweden which operates a low and medium level radioactive waste dump at Forsmark, and Finland which is building a similar dump, will not be exempt. They are both members of EFTA, and along with another 5 countries, will also become liable when they formalise their European Economic Area (EEA) pact with the EC.

"As soon as they join the EC or sign the EEA agreement," they will be forced to open their borders to other countries 'goods', which will include nuclear waste, argue Greenpeace.

The treaty of Rome, the EC's constitution, should be amended to incorporate provisions which would distinguish nuclear and hazardous waste from other 'goods', advise Greenpeace.

They should:

- "Make environmental policies an overriding objective of all EC policies;
- Allow Member States the right to take Unilateral action to protect the environment; and
- Assure that all Community measures adopted to protect the environment will move to establish the highest level of environmental protection prevailing in any Member State." □

***"The Single European Dump: for the trade in hazardous and nuclear waste in the new Europe", Greenpeace. December 1991.**

Site unseen

SEVERAL million pounds of unspecified radioactively contaminated waste has been dispatched to unlicensed hazardous waste disposal facilities, the US Department of Energy (DOE) has confessed.

In a startling burst of honesty, the DOE, which is responsible for both civil and military nuclear sites, admitted that the radioactive material from 4 sites has been sent to "as many as 11 [solid waste] facilities" in 9 states.

The announcement followed articles in local papers claiming that DOE contaminated wastes had been incinerated at Baton Rouge, Oak Ridge. The site operators, Rollins, were fined $10,000 by the Department of Environmental Quality for possession and burning of the radioactive waste. The DOE conceded to the use of Baton Rouge but declined to name the other sites.

A moratorium on such shipments has been in effect since May last year, according to DOE Secretary Watkins. It will remain in place until the Department is "satisfied that safeguards and standard procedures are in place throughout the DOE complex."

The US Nuclear Information & Resource Service comments that "Activists will now consider every incinerator, indeed every landfill, which has ever accepted DOE waste as suspect, which is probably not the outcome the DOE had in mind." □

Impoverished IAEA

NUCLEAR safeguards can now only be met if the International Atomic Energy Agency - responsible for overseeing the non-proliferation treaty - drops some of its less important nuclear safety work, according to the US Government.

Despite being faced with what is known a "zero real growth budget" for the last 6 years, the former Soviet Union's failure to pay the $20 million it pledged to the Agency for 1991 - some 10% of the total budget - is largely responsible for the cash crisis. The IAEA has entered 1992 with virtually no cash reserves.

Carlton Stoiber, director of the Office of Nuclear Technology & Safeguard, told a Senate committee recently that: "We believe it is important to the US interests and national security that the IAEA, in the first instance, and above all, apply its safeguards effectively." The US provides 25% of the IAEA's budget.

Other US government department's echo Stoibler's sentiments. William Young, Department of Energy Assistant Secretary for Nuclear Energy, believes that the last 6 years clearly illustrate the Agency's ability to "do more with less." Young says "no additional funding is appropriate in the near term."

Harold Denton, director of the Nuclear Regulatory Commission's Office of International Programmes, argues that by curtailing safeguard activities in western Europe, Japan and Canada, the Agency could concentrate its efforts on those countries in most need of assistance. However, he concedes that the "detailed revelations about Soviet-designed VVER nuclear safety deficiencies and about the Iraqi covert nuclear weapons development programme pose a real dilemma for those who believe the zero growth position should be maintained."

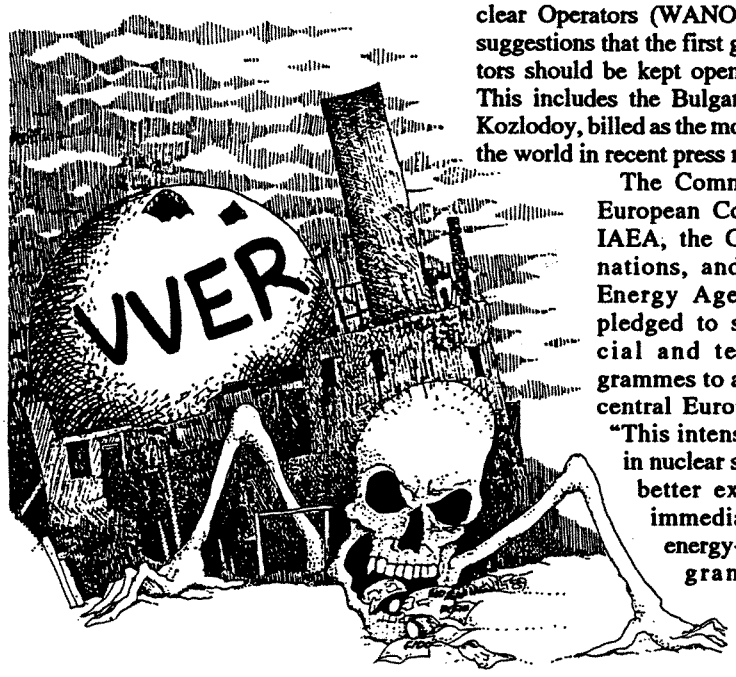
If member nations think that the new safeguards and safety issues represent "legitimate demands" then the only alternative is to increase voluntary contributions from member countries "for some indefinite period," argues Denton. He dismisses the IAEA's programmes examining the long term health effects of Chernobyl and the safety deficiencies of the VVERs, as "useful" but a drain on resources which have already been allocated: "There is a problem of matching high priority issues with available resources." Nuclear safety and radiation protection attract only 6% of the IAEA's agreed budget.

IAEA Assistant Director-General Morris Rosen points out that over the past two years the Agency's activities have been heavily subsidised by voluntary contributions and the efforts of "an unusually committed staff." Rosen clearly values the safety role of his agency: "The process of perpetually producing more within restricted resources has its limits. If the IAEA is to fulfil the safety role its member states demand, there must be a realistic support of its safety efforts through the necessary expansion of resources." □

East Nuke

ENERGY efficiency is the key to ending fears about the safety of eastern Europe's dodgy soviet VVER nuclear plant and easing their transition to the market economy, according to a recent report produced by Greenpeace*.

The European Bank for Reconstruction and Development (EBRD) - set up over a year ago to finance rebuilding of the eastern European economies - has identified the electricity sector as an important element of the infrastructure of the region. Greenpeace are concerned that the Bank are being led down the garden path by the international nuclear community, who seem more interested in lining their own pockets than providing sensible solutions.



The industry are advocating a major programme of back fitting to the ill conceived substandard soviet designs in order to achieve acceptable safety - not to full modern western standards - and attract lucrative contracts. Industry magazine, ***Nucleonics Week*** comments: nuclear companies hope that a massive spending programme will allow them to "do good and do well at the same time." Indeed, Pierre Bacher, vice president-technical of Electricity de France, said that "tens of billions of French francs" would be required to finance selected modifications on the estimated 30 VVER-440 stations in eastern Europe.

There are a number of different VVER designs (VVER is the Soviet equivalent of PWR) and while back fit safety proposals have been made for all of them, the World Association of Nuclear Operators (WANO) are opposing suggestions that the first generation reactors should be kept open beyond 1995. This includes the Bulgarian reactors at Kozlodoy, billed as the most dangerous in the world in recent press reports.

The Commission of the European Community, the IAEA, the G-24 industrial nations, and the Nuclear Energy Agency have all pledged to support financial and technical programmes to assist safety in central European reactors. "This intensity of interest in nuclear safety would be better expended in an immediate and urgent energy-efficiency programme for the countries hosting VVER reactors," says John Willis, author of the Greenpeace report.

Greenpeace point to 4 central faults in the VVERs which cannot be overcome by backfitting:

- substandard pressure vessel construction and advanced state of embrittlement;
- substandard emergency core cooling system;
- substandard containment; and
- substandard materials and construction.

The EBRD must take a new approach to the problem. Energy demand, contrary to popular belief, is not fixed. It is susceptible to a "range of programmes designed to manage and reduce it." Energy "policy in east and central Europe must begin from this conclusion," says Willis.

The least cost approach appraises investment effectiveness in three main categories: social, environmental and economic. Nuclear plant back fitting investments by EBRD fail on all three counts.

The stated costs of back fits should be taken as the "benchmark, representing the resources that are potentially available for immediate and substantive" energy efficiency programmes. Indeed, if the estimated $2 billion costs of backfitting each reactor were invested in efficiency, then the sums involved may "be greater than those available in western countries where efficiency gains have already dwarfed new supply." □

*** "Risk finance: backfit vs shutdown of VVER nuclear reactor - recommendations to EBRD on short-term nuclear investment in east and central Europe" by John Willis, Greenpeace International, November 1991.**

Dounreay's dilemmas

ACCOUNTANCY, as was expected, has taken the blame for the 11kg of uranium reported 'absent without leave' from Dounreay at the end of last year (*Safe Energy 86*).

At the end of January, Energy Secretary John Wakeham told the House of Commons that: "A reassessment of the discrepancy has reduced the earlier reported material unaccounted for of 11kg to approximately 3kg of uranium 235." He said: "The new figure takes into account the discharge of liquid waste containing uranium, and the reassessment of solid waste containing other materials." By this he means uranium has been flushed into the sea. Dounreay for their part commented: "Dounreay is well within its discharge limits ... if uranium has gone into the sea, it may have gone unaccounted for but it has not gone unnoticed."

It is worrying that while Dounreay conducts continuous monitoring of its discharge pipe the uranium left undetected. Confidence in the plants abilities to properly monitor all of its discharges can only be diminished by this latest event.

Calls for the publication of the report into the incident have been rejected by Wakeham. He used "commercial confidentiality" to evade the issue. It was a foregone conclusion that accountancy errors were going to take responsibility for the missing uranium. Without full and unrestricted access to the report, the public have no choice but to believe the investigation was a whitewash.

■ Meanwhile, Dounreay has staved-off attempts to call into question the legality of reprocessing foreign highly enriched uranium spent fuel at the plant.

An investigation of the sites planning permission by Highland Regional Council's chief planning officer, has concluded that AEA Technology can continue with the work as long as the fast breeder constitutes the larger part of the activities. If it ceased to dominate their work then there may be a case to force AEA Technology to apply for a new licence.

The original 1954 planning consent was "widely framed", commented planning chief Richard Cameron.

Closure of the prototype fast reactor (PFR) in 1994 could well herald a major change in activities at the plant, and present a situation where planning consent will again be called into question.

However, it is now looking doubtful that the PFR will be running for it to be shut down. The beleaguered fast reactor has suffered yet another set back and will now not reopen until the middle of this year. It has been shut down since July last year when a faulty pump bearing led to the plant's sodium coolant being contaminated by 35 litres of oil.

It is believed that the new fault lies with a filter in the sodium cooling circuit pump at the point of heat exchange with the steam generating plant.

Funding doubt

This news will not please the UK's nuclear utilities who are offering continued funding for the PFR after the Government money dries up in 1994. Their offer is contingent on the reactors operators, AEA Technology, improving the PFR's efficiency and reducing operating costs to a manageable level (*Safe Energy 85*).

At a press conference in London, at the beginning of December, Sam Goddard, Nuclear Electric's director of construction, said that they are looking for a minimum load factor of about 40% to justify investment. While the funding offer is "absolutely serious" final approval would have to come from Government.

Given that over the last 2 months neither the PFR nor the plants reprocessing facilities have been operating, AEA Technology would not appear to be a good investment.

■ Weeks before AEA Technology are due to apply for planning permission to extend the pits holding their low-level radioactive waste, the pits have been decried as illegal by a former waste manager for the UK Atomic Energy Authority, and until 1978 head of British Nuclear Fuel's environmental protection group.

Bob Burton, now retired, has condemned the waste trenches which hold solid waste such as small pieces of equipment packed in steel drums as failing to meet the dictate that discharges must be 'as low as reasonably practical.' Water collecting in the pits, which becomes radioactive, is pumped into the sea. If pumping were stopped the pits would flood.

"You have all this radioactive waste, which is not catalogued or anything," comments Burton, adding: "you never know what's going to happen to it sitting in water, canisters can corrode away and their contents come out."

Burton, who runs a waste management company, has unsuccessfully tried to convince Dounreay to adopt a system where the water level around to pits is reduced by drilling holes in the pits. He also wants them lined with an impermeable material, such as clay.

AEA Technology claim that the problem has been both recognised and dealt with. They have, however, declined to make public the details of their solution, arguing that it would be offensive to councillors who are due to vote on the planning request. □

Magnox go ahead

FOUR of the five magnox nuclear power stations targeted for closure by the "No Accident" coalition of environment groups (*Safe Energy 86*) have been allowed to stay open by the Nuclear Installations Inspectorate (NII).

The stations - Bradwell in Essex, Dungeness in Kent, Hinkley Point in Somerset and Sizewell in Suffolk - can continue operating as long as the suspect pressure vessel welds are monitored more closely said the NII. Sam Harbison, chief inspector of the NII, said Nuclear Electric (NE) had provided adequate justification for continuing to operate the reactors.

As a further concession NE have agreed to look at the actual welds themselves using robots to check their state of embrittlement. The NII decision has been based upon experiments not on the welds but on specimens of steel placed inside the reactor.

Meanwhile Trawsfynydd in Wales will remain closed pending further investigation. The specimens placed inside its reactor did not fare so well, yet NE now want permission to restart one of the stations two magnox reactors for a trial 6 month period. They believe that by running the reactor at a higher pressure and lower temperature than normal they will be able to strengthen the welds. If they get their way the company plan to run the station until at least 1995.

"They go till they blow," came the response from Friends of the Earth. □

Wave Energy Revue

A Scotsman, an Englishman and an Irishman.

"We might have set a little bit of an historical precedence because it is the first time we have had a man from England, Scotland and Ireland here at the same time." commented the Chairperson of the House of Commons Select Committee on Energy, Dr Michael Clark MP.

The Scotsman was Professor Stephen Salter, whose eponymous Duck was sunk by the Department of Energy in 1982; the Englishman, Dr Tom Shaw, formerly involved with the Bristol Cylinder, then working with the Severn Tidal Power Group for McAlpine, and now running his own company Shawater; and the Irishman, Dr Trevor Whittaker of Queen's University, Northern Ireland, designer of the first British wave power station, on Islay.

The trio were giving evidence to the Energy Committee on the future of wave power. While dealing with important matters, the discussion had its lighter moments.

In his written evidence, Salter commented: "We must ensure that everybody working on renewable energy has confidence in the way in which the programmes are managed. This means that it must be clear beyond any doubt that there is absolutely no negative influence from the United Kingdom Atomic Energy Authority on the infant rival renewables. There has recently been a symbolic rearrangement of barbed-wire fences round the ETSU buildings at Harwell but this is not quite enough. Pensions, contracts, canteens and promotions are still entwined. A move right out of Oxfordshire would protect the honourable nuclear engineers from cruel jokes about King Herod running Dr Barnardo's. I understand that such a move would be welcomed by many of the younger ETSU staff."

Returning to this theme later, Salter elaborated "They have dug up the barbed wire in one place and rerouted it but they have not quite taken down the old barbed wire, so it is half-way out of the site. It is as if the Atomic Energy Authority is giving birth, very painfully, to this Unit."

When considering time-scales for sea trials, Salter told the Committee "I am particularly concerned about demonstrations with dates dictated for political reasons." The 2,000MW target design stipulated by the Department of Energy in 1976 "was like demanding a fleet of trans-Atlantic jets before Bleriot."

Countering the criticism of wave power as a hazard to shipping, Salter pointed out "our plant is not moving, is not manned by drunken flag-of- convenience crews, can be marked on charts and fitted with lights, radar reflectors and sonar transponders." He adds that "not exploiting wave energy because of the hazards to shipping would be like not building power-stations on land because of the risk to road traffic."

Salter dismissed the suggestion risks to salmon returning from their Greenland feeding grounds to French, English and Scottish rivers: "I cannot write with any authority on the subject of French and English fish but I can assure the Select Committee that any salmon spawned in Scottish rivers have sufficient intelligence and tenacity to swim under, through or between any presently conceived wave energy plant."

Entering into the mood of the occasion, Michael Clark decided it was time for a historical reference.

Clark: Professor Salter, I understand that there is a wave energy device on the Isle of Islay and I wonder what you have learnt from that and what you expect to learn from it?

Salter: I really think you should ask Trevor Whittaker that question; he built it.

Whittaker: I did not build it personally but was responsible for managing the project.

Clark: In the same way that Henry VIII built various things you built this?

Whittaker: Precisely.

Another contribution came from Geoffrey Dickens MP.

Dickens: The Severn Tidal Power Group and the Mersey Barrage Company, have they come to you for much assistance over the last few years?

Salter: No, none at all.

Dickens: Yet you are the leading expert in this country?

Salter: Not on tidal energy.

Dickens: Wave Power?

Salter (modestly): Yes, but they are working on tidal energy, not waves.

Dickens: I see; you are only waves?

Salter: If they did, I would say, "The man to talk to is Tom Shaw".

Dickens: There are, surely, lessons to be learnt between the two?

Salter: Not very many.

Michael Colvin MP also got in on the act.

Colvin: I think that if you are going to set up [a wave energy association] it really must be a combination of the academics, like yourselves, who are doing the work, who are specialists, and the trade people who are going to come in and actually do the work?

Shaw: It has certainly had serious consideration, Chairman, even this year.

Salter: I tried to get one going when he [Shaw] was in McAlpine and he was too mean at the time to help us.

In another comment on commercial support, Salter mused: "They come rushing to the rescue when the battle is won."

In thanking all three witnesses for their contributions, the Chairman proffered that the star of the show, Professor Salter, was "one of the best witnesses we have had before this Committee." "The best" chipped in Geoffrey Dickens. □

Driven by the need to reduce costs, the nuclear industry has been dramatically revising its plans for decommissioning nuclear plant. FRED BARKER, author of a new report on decommissioning*, argues that decisions should be taken on a site-by-site basis, with the full involvement of both local authorities and public interest groups.

Dismantle or entomb

WHAT should happen to a nuclear power station when it reaches the end of its working life? Should it be completely dismantled at the earliest opportunity? Should complete dismantlement be postponed for over 100 years while the radioactivity inside the power station decays to more manageable levels? Or after 100 years or so, should it be 'entombed' in sand and earth, landscaped and left in perpetuity?

There are no easy solutions to nuclear decommissioning. In the past, a range of views have been expressed about which decommissioning option should be adopted. At the Hinkley 'C' Inquiry, Friends of the Earth (FoE) presented a well argued case for early dismantlement. However, it was specific to a pressurised water reactor, and not directly applicable to Britain's more complex and bulkier gas-cooled reactors. Other anti-nuclear groups have also expressed support for early dismantlement. The Shut Down Sizewell Campaign, for example, calls for early dismantlement, largely on the moral grounds that the task should not be left to future generations.

Trade unions within the nuclear industry are also moving towards a position of support for early dismantlement. Thus the Electrical Power Engineers' Association (EPEA) have submitted a paper to a working group of nuclear industry unions calling for the rejection of the 'entombment' option on the grounds that it would leave permanent 'radioactive monuments'. This they believe would be unlikely to gain public confidence. The EPEA stress the importance of demonstrating the feasibility of complete dismantlement.

Arguments against early dismantlement have appeared in this Journal (*SCRAM 62*): "The problem of radioactive waste disposal is intractable enough without adding to the problem by dismantling nuclear reactors at the present time. By the end of the century the Magnox reactors will have to be shut down. At present their highly radioactive contents are relatively isolated from the environment - trapped within the solid structure. Why rush to mobilise radioactivity, expose workers and remove the fragments of the dismantled reactor ..."

Pros & cons

It is not surprising that a wide range of views exist. After all, each decommissioning option has a number of pros and cons.

Early complete dismantlement is attractive because: it would involve early removal of the massive and imposing nuclear power station structures, thereby improving visual amenity; it could lead to an early release of a site for other uses; it would enable station operating teams to be utilised in dismantling operations; it would reduce the length of surveillance of a shutdown station; and it would minimise the number of sites dedicated for long periods to the containment of radioactive materials. On the negative side, this would be the most difficult option, involving the extensive use of advanced robotics, the creation of a massive and complex radioactive waste management operation, possible problems in fulfilling statutory obligations with regard to the radiation exposure of workers, and substantial financial costs.

The pros and cons of delayed complete dismantlement are essentially the converse of those for early dismantlement. The advantages are: the utilisation of advances in remote dismantling techniques; reduced worker radiation doses; a less onerous radioactive waste management operation and reduced costs. The disadvantages relate to: visual amenity, the length of time of surveillance, the loss of availability of the site, the non-availability of staff familiar with the operation of the station, and the proliferation of the number of sites dedicated for long periods to the containment of radioactive waste. In addition, there is the ethical question of whether it is right to bequeath to later generations a task which earlier generations could perform.

'Entombment' has some very strong advantages for the nuclear industry. It minimises the difficulties associated with radioactive waste management, disposal and transport, and dramatically reduces the costs. On the other hand, in addition to the main arguments against delayed dismantlement, there is the likely public opposition to the creation of what would be essentially a series of surface radioactive waste depositories.

Strategic review

Nuclear Electric (NE) has attempted to get to grips with the pros and cons through a strategic review of decommissioning options. This allegedly took full account of environmental, safety, technical and cost factors in a complex 'multi-attribute utility analysis'. This involved company strategists inputting values and weightings to the various factors, and then producing scores for a range of possible options.

This process resulted in the adoption of a strategy known as 'deferred safestore'. This involves the following stages:

	Time after shutdown (years)
Reactor shutdown:	0
Stage 1 (defuelling):	0-5
First surveillance period:	6-35
Build a 'safestore':	35-37
Second surveillance period:	37-135
Dismantling or entombment:	135 onwards

Although *ATOM*, the Journal of the United Kingdom Atomic Energy Authority, reported that eventual dismantling was preferred, and 'entombment' was "simply an option for future generations to consider", NE clearly favours 'entombment'. Throughout the first half of 1991 leading figures spoke enthusiastically of its advantages – reduced costs, the minimisation of radioactive waste management difficulties, and, it is claimed, public support.

According to a survey conducted for NE, 'entombment' rather than dismantlement was favoured by 74% of the people polled. John Collier, Chair of NE, argued that this was because people "don't like the thought of a lot of radioactive waste being transferred through small villages, and they don't like the thought of dust and dirt being emitted during the dismantling process".

Favoured option

Not surprisingly the Company has refused to release details of the survey, so we shall never know exactly what information people were given and how the questions were asked. One can imagine a survey conducted in a different way showing substantial public opposition to 'entombment', on the grounds that it leads to the creation of a series of surface radioactive waste repositories.

Let's be clear: if the industry gets its way, 'entombment' will happen at a maximum number of sites. As Fred Passant, NE's decommissioning supremo, acknowledged in June of last year, if the safety case for 'entombment' can be made, then this becomes by far the most attractive final option. More recently, Passant has stated that two "independent safety assessments" commissioned by the company have shown that 'entombment' is technically and environmentally acceptable. Publication of these assessments is awaited with great interest.

Don't leave it to the industry

Although a summary of Nuclear Electric's strategic review has been made public, information about the values and weightings attached to the various factors has not, and will not, because NE considers the review to contain "commercially valuable" information. This may well be true as Scottish Nuclear and British Nuclear Fuels are also conducting reviews, but further details would also reveal how the company's business interests have shaped and influenced the values and weightings ascribed to environmental and social factors.

So, the adopted strategy will no doubt be the perceived optimum one for NE, but not necessarily for the workers at a particular nuclear power station; for the public living in the surrounding area; for the local authority responsible for the health, safety and well-being of local residents; nor for the environment in the long term

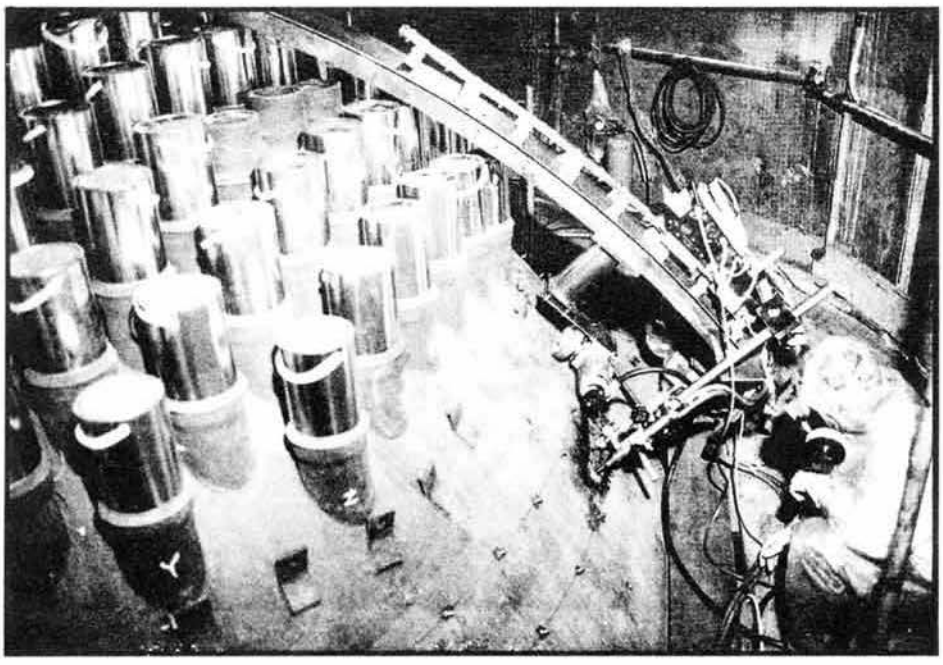
It is therefore important for local authorities and other public bodies to carry out their own assessment of the relevant factors so that they can form a view on what constitutes the optimum approach to decommissioning at a particular site. Key local issues will be of particular concern, including visual impact, the local economic consequences of station closure and future land use.

Decision making

The report produced for the Nuclear Free Local Authorities* aims to provide the information that local authorities and public interest groups can use to begin to carry out their own appraisals. It reviews the strategies for decommissioning; the technical feasibility of dismantlement; international practice; the safety issues; costs and financing; the radioactive waste management implications; and other important local issues.

The report does not attempt to identify a single approach that should be applied to the decommissioning of all nuclear power stations: indeed it argues that an optimum approach needs to be identified on a site-by-site basis. What the report does argue, however, is that a decision making process must be developed to enable the appropriate public authorities and interest groups to participate fully. It stresses that decisions should not be left to the industry alone, and that the public and local authorities in the area of a nuclear power station should be given proper opportunity to input their views, particularly on the social and planning issues that arise. Only in this way can a publicly acceptable approach to decommissioning be found.

The report also begins the task of identifying ways in which the decision making process might be widened. It may, for example, be arguable that the main decommissioning stages each require planning permission, and that environmental assessment must be carried out. Over the coming months these possibilities will be discussed with local authorities which have nuclear power stations in their areas, to see what action can be taken. □



Dismantling the top dome of the Windscale AGR

*** "The Decommissioning of Nuclear Power Stations" by Fred Barker, Jan 1991, 115pp, £30. Available from the Nuclear Policy and Information Unit, Town Hall, Manchester, M60 2LA. Copies of the Executive Summary are available free of charge.**

Completing his history of the Hydro Board, PAT AGNEW, Scottish Green Party energy speaker, examines the effects of privatisation. Highlighting the economic realities of the company's private sector successor, he discovers that the idealism on which the Board was founded has completely disappeared.

The Hydro: the end of a dream

DURING World War II a deal struck between Tom Johnston, then Scottish Secretary, and Winston Churchill led to the establishment of the North of Scotland Hydro Electric Board. Johnston, a socialist, intended that the board would not only bring power to the people of the north of Scotland, but would also foster any projects "with any measure for economic development or social improvement," in the area (*SE 86*). Privatisation has spelt the end of Johnston's dream.

In 1988-89, the last year before privatisation, the total consumption of electrical energy in Scotland was 25 billion units* (bu). Of this just under 4bu – about 15% – came from hydro power. It is hard to give exact costs for coal fired and nuclear power: nuclear, in particular, is subject to a lot of uncertainty because the costs of long term waste storage and decommissioning are not known. But in that year these costs were about 4p/kWh for coal and 6p for nuclear. The comparative costs for hydro power were 0.85p in the North and 0.35p in the South (the Galloway scheme has always been very profitable).

Nuclear costs

The Hydro Board had high distribution costs, and because of the Joint Generating Agreement it was saddled with some of the costs of nuclear power: consequently it made a loss. On privatisation, the Cruachan pumped storage plant was handed over from the Hydro Board to Scottish Power plc: otherwise the property, the business and the staff of Scottish Hydro plc were identical to those of the North of Scotland Hydro-Electric Board it succeeded. It was therefore surprising to see, in their first annual report, that Scottish Hydro had made a profit of £50m, after paying interest charges of £60m.

Examination of the report shows that the principal difference from the previous year's accounts, apart from the removal of the payments for the nuclear power stations, was in the manner of calculating depreciation. The Hydro Board had always put in a figure for depreciation of civil engineering works such as dams and tunnels: they had used a depreciation period of up to 80 years, which although a long time is a reasonable period over which to write off the cost of a dam. The 1989-90 accounts of Scottish Hydro contain the words; "Land and certain hydro civil assets, specifically dams, tunnels, roads and associated stone buildings, which are deemed to have an infinite life since they are maintained in good repair, are not depreciated". The figure for depreciation in those accounts is £42m less than that in the previous year, which accounts for the greater part of the £50m profit.

The reports for the two consecutive years were in quite different forms, making it difficult to discover where that £50m had come from; indeed there is a warning in the report that "the Profit and Loss Account for the North of Scotland Hydro-Electric Board for 1988-89 is not directly comparable with that of the Company for 1989-90." It may be unfair to accuse Scottish Hydro of deliberately confusing things, but it looks as if they were not too keen on comparisons being made.

Accounting practice

Scottish Hydro at that time was 100% government owned, and whether they added £50m to the depreciation and therefore put it into the company's reserves or took it out as profit, would have made little difference to the outside world, because it merely amounted to the Government shifting its money from one pocket into another. Both methods of accounting were within the limits of accepted practice. But if they had declared that profit before privatisation, it could have been claimed, under the Social Clause, by anyone with a "Measure for the Economic Development or Social Improvement of the North of Scotland ...". Coming at the time that it did, it was used as bait to attract private investors. The manner of the privatisation has ensured that control of Scottish Hydro, as of the other privatised companies, will lie with the big financial institutions.

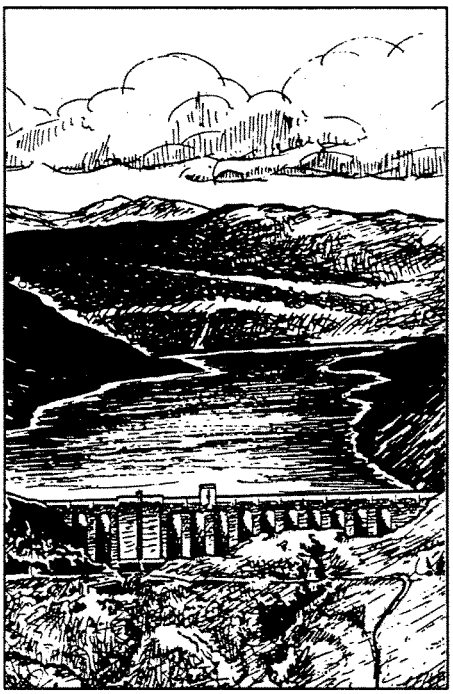
Scottish Power plc too, in their 1989-90 report, use the wording "Land and certain hydro civil assets, ... are not depreciated", as in the report of Scottish Hydro. This is odd: apart from Cruachan, their "hydro civil assets" had, with the exception of a tiny plant in Galloway, been written off long ago. That sentence is irrelevant to their accounts: it was obviously only put in to make them conform to the accounts of Scottish Hydro, presumably so that the reader should think that this is the normal practice.

Before those reports were published, an organisation with a "measure for the economic development or social improvement" of a part of the North of Scotland Region as defined in the 1943 Act, had asked Scottish Hydro for a fairly small amount of financial support. The reply, signed by the chairman, refused to help on the grounds that the company's "sponsorship and charity budget" was exhausted. When the accounts were published there was no sign of such a budget. The idealism that had been so evident in the early days of the hydro board was well and truly dead.

Total control?

Scottish Hydro is slightly unusual among privatised companies, in that it has been given the obligation of continuing to supply its existing customers: but apart from that, the first duty of the directors is to make money

Tom Johnston



for the shareholders. That being so, it is natural that they should go out to sell electrical space heating. Their latest form of space heating goes under the name of "Total Control". Their sales drive is being targeted particularly at people using gas: they have been offering their customers £100 for each old gas fire. They are selling this idea on a tariff that may well be below the marginal cost of increased generation. It looks suspiciously like a "loss leader" - once they have got the customers hooked it will be surprising if they manage to hold down the price to present levels.

Monopoly

Even so, it is more expensive than gas, but few customers know this because gas is sold by the Therm (29.3Kwh = one Therm). This is a case of a monopoly supplier of an essential public service going out to make money at the expense of the general public. Scottish Power, also, claim credit for increasing their market share in the new housing sector: both companies clearly think that an increase in the use of electrical heating is a good thing.

Electrical heating increases emission of carbon dioxide (the principal 'greenhouse gas') and other pollutants. This is because any extra load on the grid falls on the coal fired power stations, which are not particularly efficient, and coal contains more carbon than methane (the main component of natural gas). Thus electrical space heating causes four times as much 'greenhouse effect' as does heating with gas. The Government has an international commitment to reduce these emissions: they have never formally committed themselves to doing anything about it for the next ten years, but the further we go in the wrong direction the more difficult it is going to be to retrace our steps.

Perversely, Scottish Hydro will claim that by promoting the building of combined cycle gas fired power stations they are reducing greenhouse gases, because gas contains less carbon than coal. Combined cycle power stations have a peak efficiency of 50% or so, but they will not operate all the time under optimum conditions. Therefore their average efficiency, in practice, is likely to be about 40%. Since 10% of the power that they generate will be lost during transmission, little over a third of the energy in the gas will reach the heaters and cookers of the customers. The amount of gas under the North sea is strictly limited: it is reckoned that it may last us for something between 30 and 50 years. To throw nearly two-thirds of it away is improvident. A far more effective way of reducing carbon dioxide emissions is to replace electrical heaters and cookers by gas fired ones. This has the added advantage of reducing the customers' fuel bills.

Policy

The present government takes a perverse pleasure in pretending that they have no energy policy. This, of course, is untrue: as far as electricity is concerned, the policy laid down by the Weir committee in 1925 has been followed, with minor variations, ever since. It was an excellent policy in 1925 but it makes little sense now.

The Weir committee's proposals were based on certain assumptions:

1. We would be better off if we used more electricity.
2. The most efficient and therefore the cheapest way to generate it is in large power stations.
3. Interconnecting these stations by means of the grid would reduce the amount of spare plant needed and thereby reduce costs.

The first of these assumptions is now definitely untrue. In so far as the recent increase in consumption has been due to the increased use of electrical space heating, this is the most expensive means of heating and an inefficient use of fuel, and we would be better off without it. Also the report by the Energy Efficiency Office on "Energy Efficiency in Domestic Electric Appliances", published in 1990, shows that we would be a great deal better off if we used more efficient appliances. In the particular case of Scottish Hydro, there is a supply of a certain quantity of power from their hydro plants, which is very cheap: power from any other source is much more expensive. It follows that, the less power they sell, the lower is the cost of power per unit in their area. They do not make power cheaper by selling more of it: there is a marked diseconomy of scale.

The second assumption is also untrue. Combined heat and power plants are roughly twice as efficient as large power stations, and the small ones are most efficient of all. For example, combined cycle gas fired power stations are claimed to have a peak efficiency of 52%. Even when such a station is operating under ideal conditions 10% of the power generated will be lost in transmission, reducing the overall efficiency to 47%. The efficiency of small gas-fired CHP plants is up to 97%. The capital cost, per kW installed, is less than that of large power stations.

Inefficiency

The third assumption is, of course, still true. But the increasing unit size of generators has brought problems. To allow for breakdowns, it is necessary to have spare plant standing by sufficient to take the place of the largest generator in use. If that is 1,000MW, it is necessary to have 1,000MW of spare plant on standby. The increase in unit size may therefore have actually decreased the overall efficiency of the system.

The continued acceptance of the first two assumptions led to the system being privatised in such a way that the new owners have every incentive to sell as much electricity as possible, regardless of efficiency: and that they have no incentive to buy it from small but efficient producers.

Lord Weir had the courage and the authority to tell his fellow Conservatives that the national interest was more important than party dogma but the privatisation of 1989 was put through in such a way that the new companies have a vested interest in increasing consumption. This means that they are actively promoting the destruction of natural resources, inefficiency, waste and pollution. Clearly, this attempt to perpetuate a form of organisation that is badly out of harmony with the needs of the present day must not prevail. □

*** One Billion Units (bu) = one thousand million kWh (one TWh)**

■ **A fuller account of the Hydro's history and changes to the Scottish Electricity Supply Industry proposed by Pat Agnew can be found in full in his book, "Hydro power and Electricity in Scotland", available from Clyde Books, 19 Parnie Street, Glasgow, £2.50 + 50p p&p.**

Sea dumping of radioactive waste has, since 1983, been procluded under a moratorium established by the London Dumping Convention. PETE ROCHE, a Greenpeace nuclear campaigner, reports on pressure from the nuclear industry to allow ocean dumping of nuclear waste.

Dumping Convention

REGULATING the disposal of waste at sea from ships, aircraft and other man-made structures, but not land-based discharges, the London Dumping Convention (LDC) is one of the principal global agreements addressing the prevention of marine pollution. It was adopted and opened for ratification immediately after the United Nations Conference on the Human Environment held in Stockholm in 1972.

Two decades on, the world is about to commemorate the anniversary of the Stockholm Conference with the United Nations Conference on Environment and Development (UNCED) to be held in Brazil in June. Clearly, this would be a good time to re-examine the LDC and bring it up to date with current environmental, social and political realities.

Sixty-seven countries are now members of the Convention, which convenes every year in London. The 1991 meeting held in November, was the fourteenth. Greenpeace International, which has had observer status at the LDC since 1981, makes a substantial contribution to the work of the Convention, particularly on the issue of radioactive waste dumping at sea.

Contrary to popular opinion, the dumping of low and intermediate level radioactive waste at sea has never been banned – it is only the subject of a moratorium, pending the completion of studies undertaken by the LDC's Intergovernmental Panel of Experts on Radioactive Wastes (IGPRAD).

Radioactive waste dumping at sea was halted in 1983 as a result of the first LDC resolution calling for a suspension of this practice. The UK was all set to ignore the resolution, which is not legally binding, but were thwarted by action taken by the National Union of Seafarers. Later, in 1985, the Convention established an indefinite moratorium pending the completion of a number of studies on the scientific and technical, as well as legal, social, economic and political aspects of radioactive waste dumping at sea. IGPRAD is now co-ordinating some of these studies, and has asked the International Atomic Energy Agency (IAEA) to undertake the rest. Their final report is now expected in late 1992 or early 1993, ready for discussion at the sixteenth LDC meeting in 1993.

Officially no radioactive waste dumping operations have been carried out at sea since 1982. However, several countries, including the UK, are "keeping their options open" with regard to sea disposal, in the hope that public opposition may weaken with time. Public opposition to land based disposal options is the main reason given by the nuclear industry for keeping the sea option open. However, sea dumping is still near the top of the list of people's environmental concerns in the UK[1].

Political clamour

In the ten years since sea dumping was suspended no new arguments for resuming the practice have emerged. Indeed the case for banning ocean dumping of all kinds of noxious waste has never been stronger. The political clamour for more environmentally responsible waste management practices is now far stronger than it was in the early 1980s. The LDC itself agreed in 1990 to phase out industrial waste dumping at sea by 1995, so if radioactive waste dumping were to be resumed, it would be the only kind of industrial waste being deliberately dumped at sea. A recommendation by IGPRAD to resume ocean dumping would also be inconsistent with the promises of better environmental conduct governments are expected to make at UNCED.

The nuclear industry makes no secret of the fact that – for them – the best place to dispose of the bulky wastes which arise from the decommissioning of old nuclear reactors is the ocean. If there was a resumption of sea dumping for this purpose the quantities of radioactive waste dumped would be a dramatic increase on pre-1983 levels.

The Nuclear Energy Agency of the Organisation for Economic Cooperation and Development recorded the quantities of radioactive waste dumped in the North-East Atlantic between 1949 and 1982. The cumulative gross mass is estimated to be about 142,000 tonnes. Passant and Ward, of National Power, have calculated that 2.7 million tonnes of decommissioned wastes will result from the current reactor programmes in Western Europe between now and 2100. This figure does not include any waste arising from day-to-day operations, nor decommissioning fuel cycle facilities, military facilities or submarines.[2]

IGPRAD held their fourth meeting the week prior to the 1991 LDC meeting, in London as part of its ongoing review of the risks related to the ocean dumping of radioactive wastes. Unlike the LDC, Non-Governmental Organisations (NGOs) have been prohibited from participating in these meetings, but Greenpeace was invited to make a presentation, following a precedent set in 1990. Greenpeace urged IGPRAD to wrap up its risk review and endorse a formal ban on radioactive waste dumping, in time for agreement to be reached at the 1992 LDC meeting. Unfortunately some delegates wanted a delay until 1993, arguing it was necessary to wait for a report from the UN body called Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP). This group is comprised mostly of advocates of the outdated idea that the sea has a certain capacity to assimilate waste. Greenpeace have been highly critical of their work, accusing them of being out of touch with current environmental realities. Greenpeace also submitted to IGPRAD critiques of the IAEA's comparative assessment of dumping at sea and land-based disposal of radioactive waste, as well as information on soviet dumping at sea since 1983 (*Safe Energy 86*).

Although IGPRAD's decision to wait until 1993 to report, is a slight setback, NGOs, including Greenpeace, "which submit scientific and technical papers" will be allowed to attend and fully participate in future IGPRAD meetings.

The 1991 LDC meeting agreed to forward a resolution to the UNCED process on "a precautionary approach in environmental protection". The increasing acceptance by international conventions of this precautionary approach will, if taken to its logical conclusion, have major implications for the nuclear industry in general, and Sellafield in particular.

Environmental policy at an international level is shifting away from

the 'permissive approach' which is based on the assumption that the environment has a capacity to receive and render harmless the vast quantity and variety of industrial wastes. It is now widely accepted that this approach is not only dangerous and irresponsible, but also that it doesn't represent a sound scientific basis for the protection of the environment. Even the most sophisticated environmental impact assessment models contain substantial inherent uncertainties due to the overwhelming diversity and complexity of biological species, ecosystems and chemical compounds entering the environment. What were once considered perfectly safe levels of particular substances have subsequently been found to be unsafe.

The 'permissive approach' is being replaced by the 'precautionary principle' which is based on the prevention of contaminants entering the environment. Any definition of the 'precautionary principle' should include the following elements:

1. Prevention of contaminants entering the environment, rather than the traditional notion of attempted control and 'allowable emissions' based on the assimilative capacity theory. This elimination of inputs should be applied to all persistent unnatural substances as well as naturally occurring substances which are toxic and persistent.
2. Preventative action is required before conclusive scientific proof regarding the cause and effect relationship between contaminants and resulting ecosystem damage is available.
3. The burden of proof should be shifted to the proponent of an activity to demonstrate that it is not likely to harm the environment or human health.
4. A waste prevention audit of all industrial plants and companies should be required in order to a) identify substances targeted for phase out programmes and b) identify the corresponding clean production methods to achieve the phase out.

A host of international environmental fora have adopted the 'precautionary principle' including: the North Sea Ministerial Conference; the United Nations' Environment Programme (UNEP) Governing Council; the Nordic Council; the EC Parliament; and the Bamako Convention, adopted under the auspices of the Organisation of African Unity.

At the 1991 LDC meeting, although the United States objected to the use of the word "principle", the definition agreed included the concept of prevention rather than attempted control; preventive action before scientific proof; and that clean production is the means for implementation.

Sustainable societies

UNEP have defined clean production as an "approach [which] demands that all phases of the life cycle of a product or process should be addressed with the objective of prevention or minimisation of short and long term risks to humans and to the environment." This is a comprehensive "approach to achieving the goal of sustainable societies".

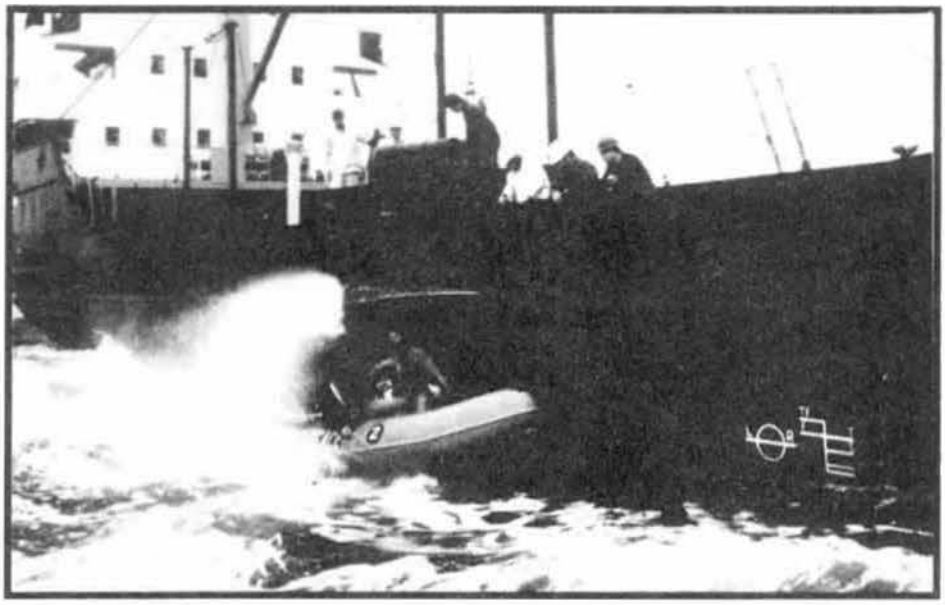
A multitude of clean production experts, pilot projects and case studies have developed over the past few years. The primary hurdle to widespread implementation is the lack of industrial and political will, not a lack of physical or technical capability.

Greenpeace are urging the Contracting Parties of the LDC to adopt an action programme for the implementation of the 'precautionary principle' as a realistic and necessary component of effective marine protection. This programme calls for targeted waste inputs to be phased-out while clean production methods are phased-in. Discharge and emission permits should only be granted when the application is accompanied by a detailed phase-out plan and a specific timetable. Measures to transfer pollutants from one environmental medium to another should be excluded.

Although the LDC only covers ocean dumping, and not discharges into the marine environment from land-based sources, the increasing adoption of the 'precautionary principle' has wide implications. As an increasing number of international fora accept the principle with regard to the marine environment, the days of liquid radioactive effluent discharges into the Irish Sea from Sellafield must be numbered. With this new mood, the international community can be expected to take a pretty dim view of any new discharge authorisations for Sellafield's new Thermal Oxide Reprocessing Plant (THORP).

If the 'precautionary principle' is taken to its logical conclusion, it should be applied to all environments, and not just the oceans. The planned discharges of Krypton-85 into the atmosphere from THORP can also be expected to come under increased international scrutiny. Applying the 'principle' to deep geological environments would clearly rule out deep disposal of radioactive waste. Applying the concept of clean production to electricity would obviously mean phasing-out nuclear power and phasing-in renewable energy.

The 1992 UNCED and LDC meetings both promise new hope for the protection of the global environment. But progressive governments need to stay on their guard against the nuclear industry's pressure to make nuclear waste a special case. In the UK, we need to keep the pressure on our Government, to make sure that they don't try to put a spanner in the works, and that the hopes of the Brazil conference, in particular, are fully realised. The nuclear industry worldwide has horrendous decommissioning problems looming in the next century – it will have to find a resting place for the huge quantities of waste somewhere – the last place it should end up is the ocean. □



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With a General Election imminent, GRAHAM STEIN looks at the energy policies of the political parties. Is there a future for nuclear power, and what role will renewable energy sources play?

Party power lines

IF environmental concern really has grown during the eighties, then, as the General Election approaches, energy policy should be high on the political agenda.

Despite the nuclear industry's attempts to appear 'green', nuclear power is receiving little political support. The Scottish Nationalists call for a complete phase out "as soon as possible"[1]. The Scottish Greens would do the job in four years[2], their English and Welsh counterparts would set a deadline once in office[3]. Plaid Cymru are "opposed to the construction of any new nuclear power stations."[4] The Liberal Democrats "would phase out all nuclear power stations by 2020," and cancel Sizewell B and Thorp.[5]

Of all the opposition parties, Labour's anti-nuclear stance is least convincing. They would proceed with Sizewell B even though they admit "the electricity generated will cost twice as much as from other sources"; and Thorp would stay too.[6]

"We will not build any more nuclear power stations"[6] they said in 1990, however, by 1991 they would "not invest in new nuclear power stations"[7]. The original statement allowed private nuclear stations to be built, the update would also permit private capital backed plant built by state owned Nuclear Electric and Scottish Nuclear. In another worrying update, "We will not extend the life of existing [nuclear] power stations"[6] has had "beyond their safe life span."[7] added. Given the Nuclear Installations Inspectorate's track record, the phrase could be used to delay a nuclear phase out for decades.

None of the opposition parties see the need for the 1994 nuclear energy review. That review constitutes, more or less, the Conservative's policy; everything is on hold until "Sizewell B is completed in 1994"[8]. But there can be no doubting Tory gut support for nuclear power. In a typical statement, Energy Secretary John Wakeham told the nuclear industry it "should be well placed to present a very powerful case to the 1994 Review of the Nuclear Industry."[9]

Their policy on low and intermediate level radioactive waste (LLW & ILW) disposal is to back Nirex, and in addition they have "not ruled out sea disposal for large items such as boilers from decommissioned power stations."[10] High-level waste (HLW) will be "stored for at least 50 years ... to allow it to cool", and will then be vitrified. Beyond that, the Government "recognises the need to provide methods of permanent disposal eventually for ILW and HLW."[10]

In 1989, Labour favoured a "deep underground storage facility",[11] their policy now is more vague: "Nuclear Waste must be stored safely and held securely ... in such a way that its characteristics can be monitored easily [and] be capable of being retrieved if monitoring shows up any signs of danger or if further research and development makes possible better and safer alternative ways of dealing with it ... nuclear waste is generally best dealt with closer to where it originates."[6]

Above ground storage

The Liberal Democrats "would begin construction of a deep underground repository for LLWs; ... [and] ensure that HLWs are stored above ground in secure and monitored sites until such time as a method of safe disposal can be developed."[5] An earlier intention to reclassify ILW into "higher" and "lower" categories[12] has been overlooked in their most recent policy document, leaving them with no clear policy for ILW.

An end to spent fuel imports and reprocessing is called for by the SNP, with above ground monitored storage of all nuclear waste pending research into safe long term storage/disposal.[13]

Plaid Cymru sum up the problem without offering any solution: "the fundamental problems posed by HLW have not been solved, and the stock-piles of dangerous waste are growing."[4]

Opposing "irretrievable deep burial of nuclear waste", the Greens "support research to find a genuinely safe alternative." In the interim, they back "on-site dry storage".[2]

Although all parties are agreed on the pre-eminent role of energy conservation in ameliorating global warming, they offer widely differing strategies for its promotion.

The Tories "will press for agreement in the European Community (EC) on a common energy labelling scheme", many of "the Government's initiatives aim to inform the customers of [energy conservation] benefits and encourage them to take action."[10]

Initial opposition to EC proposals for an energy tax appears to be waning: "In principle it is likely that some form of discrimination of the kind like the carbon tax will be necessary."[14]

Labour will set "a target to freeze [CO_2] emissions at their current level by the end of the century – the EC Commission target." They also contemplate world-wide tradable CO_2 emission permits, but oppose a carbon tax. Labour are planning for "cleaner generation" of electricity in addition to energy conservation and efficiency. "We shall oblige the energy industry to concentrate on energy saving rather than maximising sales ... Least Cost Planning."[6]

They intend to "take control of the National Grid Co (NGC)", regulating the industry to "ensure security of supply, promote environmental objectives including the development of renewables, and ensure careful stewardship of our fuel reserves."[6] No policy is yet available for Scotland, which is not covered by the NGC, but they intend to present one to their Spring Scottish conference.[15] An Energy Efficiency Agency is also proposed, "to encourage and promote a national efficiency programme."[6]

"An environmentally sustainable economy" is the goal of the Liberal Democrats. They call for a CO_2 reduction of 30% on 1990 levels by 2005. A 'fiscally neutral' energy tax, in line with current EC proposals is supported, along with subsidies and removal of VAT for energy-conserving and pollution-reduction activities and products. Changes in the regulation of the energy utilities to "encourage energy conservation" are proposed, with "modification of the financial rules under which they operate."

They would establish Least Cost Planning, an Environmental Protection Agency, Energy Auditing, Tradable Emission Licences, Pollution Taxes, energy efficiency labelling, environmental grants and subsidies, and an extension and improvement of Home Insulation Grant and Home Energy Efficiency Schemes.[5]

The SNP plan to bring the electricity and gas industries back into public ownership.[16] Illustrating their support for energy efficiency, they point out that "the £2,000m capital cost of Torness would, if invested in home insulation, yield about four times more energy than the power station ... be safer, quicker to implement, have lower running costs, last much longer and provide more employment." Their programme would include: a comprehensively funded programme of insulation (to Swedish standards); a radical upgrading of insulation requirements for new buildings; support for the development of new energy efficient technologies; and promotion of energy efficiency in industry, agriculture and transport.[1]

Plaid Cymru believe that a 25% reduction in energy consumption can be achieved before 2005 and 50% before 2020. They believe: "100% grants for the insulation of existing buildings will be far cheaper than the capital cost of a single power station", and propose stringent standards for all new buildings. 'White goods' that fail to meet "rigorous standards" will be banned, and "the initial cost of efficient lightbulbs should be met by the electricity industry."[4]

Fossil fuels would be subject to a 'Resource Tax' under Green Party plans, with some of the funds raised "used to subsidise a nation-wide domestic energy saving initiative." Building regulations would be amended and across the board standards would be applied to all buildings, old and new; tenants would have the right to demand that their landlord meet the cost of meeting the new standards. A National Energy Office and Regional and Local Energy Authorities would promote energy efficiency and conservation.[3]

Renewables

The Tories believe that there is the potential for renewables to "contribute up to the equivalent of nearly a quarter of current electricity supply by 2025." Government policy "is to encourage the development and application of all renewable energy sources ... where they show promise of commercial viability in Britain. Through enhanced programmes on novel technologies, including research, development, demonstration and promotion, and through the [English and Welsh] Non-Fossil Fuel Obligation (NFFO), the Government will work towards a figure of new renewable electricity generating capacity of 1,000MW in 2000"[10] (about 2% of total generating capacity).

This target may be raised following the announcement of an increase in the renewables tranche of the NFFO. Energy Minister Colin Moynihan said the 1,000MW target will be reassessed "in line with our belief that renewables could potentially produce 20% of our current electricity demand by the year 2025, if they can be commercially deployed".[17]

Labour promise to "give urgent attention to boosting the use of renewable energy", transferring research and development funds "from nuclear energy to more promising areas of environmentally-benign research." Central to this is a Renewable Energy Agency, "whose job will be to promote and develop the use of renewable energy sources. It will takeover and augment the work on renewables of the Atomic Energy Authority, oversee the expanded research programme and promote the development of a British renewables industry."[6].

Targets set

A similar analysis to Labour's is offered by the Liberal Democrats: "Britain, and especially Scotland, possesses a substantial advantage in renewable sources of energy ... yet only 1% of current energy use is derived from them." They offer: an immediate extension of the renewables provision of the NFFO to Scotland and Northern Ireland; an immediate modification of the renewable NFFO cut-off deadline from 1998 to a 20 year project lifetime; targets for the proportion of energy to be derived from each source, including an objective of 20% of generating capacity from renewable sources by 2005; an immediate doubling of RD&D funding; environmental subsidies for viable projects; a prototype offshore wind farm, and detailed evaluation of the UK's wave and offshore wind energy resources; and, an early start to the construction of a Severn Barrage.[5]

SNP renewables policy calls for development of "Scotland's outstanding potential for ... renewable energy sources ... their naturally intermittent output complementing the existing hydro capacity with its unique flexibility and potential for energy storage.[1] Though not a firm target, they believe Scotland could "generate half our electricity by clean, green energy sources by the end of the century ... all we need is the political will."[18]

They propose a 70% increase in hydro power capacity with small and large scale projects (to 1,700MW). Scotland is the best location for windpower in Europe, with the potential for 1,000MW of capacity; and is also the best location for wave power, which together with tidal power offers another 350MW by 2000. The cost of such a programme is put at £2bn - "the cost of Torness nuclear power station".[18]

"Wales is ideally situated to take a leading part in the development of new technologies", observe Plaid Cymru. "Our geographical location, with a long coast-line facing the Atlantic, combined with the research facilities of the University of Wales, a major steel industry and a tradition of heavy engineering offer us a unique opportunity." They believe that "by 2020 [renewables] could provide half of our reduced electricity demand". They call for: 50 wind farms to provide 500MW of capacity; about 10 tidal barrages to provide 600MW capacity; and another 600MW from offshore wind and wave.[4]

With a long-term aim of meeting all energy needs "from non-polluting renewable sources", the Greens propose: positive tax and grant incentives; minimal bureaucratic interference; R&D funding on a scale previously enjoyed by nuclear power; biogas to be used as widely as possible; marine and estuarine barrage schemes to be tried on a small scale initially, and only extended if found to be ecologically acceptable; and, the use of wind energy, initially on-shore particularly at redundant power station sites, with a view to developing the much larger resource offshore.[3]

With the preliminary volleys of the General Election campaign already fired, their is little sign that the fighting will spread beyond the traditional battlegrounds. With environmentalism excluded from the main parties battle plans, the question is, will their pre-election interest be revived when the dust settles? This depends not just on the victors, but on continued pressure from campaigning groups concerned not just with the battle but with the war. □

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In approving the International Commission on Radiological Protection recommendations for dose limits, the National Radiological Protection Board is disregarding its own findings, argues Dr PATRICK GREEN, Friends of the Earth's radiation campaigner.

Ignoring the risks

ONLY one year after the International Commission on Radiological Protection (ICRP) acknowledged that radiation is 4-5 times more dangerous than previously recognised, the National Radiological Protection Board (NRPB) has published a new study[1] of radiation workers which suggests that the ICRP is still underestimating the risk by a factor of two. However, the NRPB has not recommended any action to further reduce doses in light of the new findings and seems content to let the ICRP's recommendations form the basis of European Law.

Atomic bomb survivors

The ICRP's 1990 reassessment of cancer risks was based upon new studies of the cancer mortality rates amongst the Atomic Bomb survivors in Hiroshima and Nagasaki. These showed that radiation was around 8-10 times more hazardous than previously assumed. However, these risk rates were not directly used to derive the ICRP's dose limits. The ICRP argued that the Atomic Bomb studies would tend to overestimate the risk faced by nuclear workers and members of the public. This was because they believe that radiation doses received very quickly are more dangerous than the same dose received over long periods of time (the Atomic bomb survivors received their dose in a fraction of a second, compared to radiation workers who are exposed to radiation over a number of years).

Consequently, the ICRP recommended that risk rates derived from studies of the Atomic Bomb survivors should be reduced by applying a Dose Rate Effectiveness Factor (DREF) of two. This was why ICRP concluded that radiation was 4-5 times more dangerous than previously believed and not 8-10 times as suggested above.

Studies of radiation workers

The ICRP have concentrated on studies of the Atomic Bomb survivors to quantify the risk from radiation exposure because the data has been collected over a longer period of time and covers a wider range of exposure. The quality of this source of data is considered better than any other. To date, studies of radiation workers have not been used to derive safety standards because the data has not been of sufficient quality.

The new NRPB study was the first analysis of the National Registry of Radiation Workers and examined the dose and health records of 95,000 radiation workers in the UK. There are four important findings:

1. There was a positive, statistically significant association between leukaemia (except chronic lymphatic leukaemia) deaths and radiation dose.

2. The central lifetime risk estimate for fatal leukaemia, was 1.9 times higher than recommended by ICRP in 1990.

3. There was a positive, although not statistically significant, association between the death rate for all cancers and radiation dose.

4. The central lifetime risk estimate for all fatal cancer was 2.5 times higher than recommended by ICRP in 1990.

Implications of new study

These results are subject to a considerable amount of statistical uncertainty (the 90% confidence limits ranged between a protective effect at low doses, and risks up to 6 times the ICRP's estimate). Nevertheless, the risk estimates quoted are the NRPB's best estimates, and provide good evidence to undermine the ICRP argument that radiation doses received over time are less dangerous than the same dose received very quickly. The central risk estimate obtained from the new study is the same as that obtained from studies of the Atomic Bomb survivors before it is reduced by the application of a DREF. In other words, the new NRPB study suggests that radiation, at low doses and dose-rates, is ten times more dangerous than thought when the current legal safety standards were introduced in 1985.

However, the NRPB concluded that its study does not require any immediate change to the risk estimates used for protection purposes. It has justified this by arguing that, in view of the statistical uncertainty surrounding the results of the new study, the ICRP's risk estimates were not "unreasonable".

The NRPB also announced that further work was being undertaken, the results of which are to be published in two years time. They expect this follow-up study to produce more certain results.

Gambling with workers lives

Their response is totally inadequate. By recommending further studies and nothing more, the NRPB is gambling with radiation workers lives. By the time further results are published in 1994 it will be too late to stop the new ICRP recommendations being adopted as the basis of European Law.

The European Community is currently drafting a new EURATOM Directive based upon the ICRP's recommendations (*Safe Energy 84*). This is due to be adopted by the Council of Ministers at the end of 1992 and will become legally binding on Member States in early 1993. New UK legislation based on the ICRP recommendations is expected to reach the statute books in 1995-96.

Refusing to comment

Although important, this new study is not the first evidence to suggest that the ICRP's recommendations are inadequate. The ICRP did not address the Gardner report and has even failed to reduce its dose limits in line with its own reassessment of cancer risks (*SCRAM 76, 80 & 83*). The new study means that it is now even more urgent that radiation dose limits are reduced.

However, not only has the NRPB refused to comment on the ICRP's recommendations in light of its new study, it has also refused to address the existing inadequacies in the recommendations. Just before Christmas the NRPB finally published its comments, in the form of a consultation document, on the ICRP's 1990 recommendations.

The NRPB has a statutory duty to advise the Government on the acceptability of the ICRP's recommendations for use in the UK. Yet, instead of stating that the ICRP had failed to act on its own reassessment of cancer risks, the NRPB simply ignored the issue. Previously, the Board argued

that the ICRP had failed to explain why it had not reduced its dose limits by a factor of 4-5 (*Safe Energy 84*). Now it simply states that dose limits in EC Member States "may be neither more, nor less restrictive than those in the Directive."[2].

The NRPB did issue recommendations on a new ICRP concept; the dose constraint. A dose constraint is a target set to ensure that doses are kept as low as reasonably achievable (ALARA) within the dose limits. Dose limits represent the legal maximum that must never be exceeded. Exceeding a dose constraint will not attract the same legal penalty as breaching a dose limit.

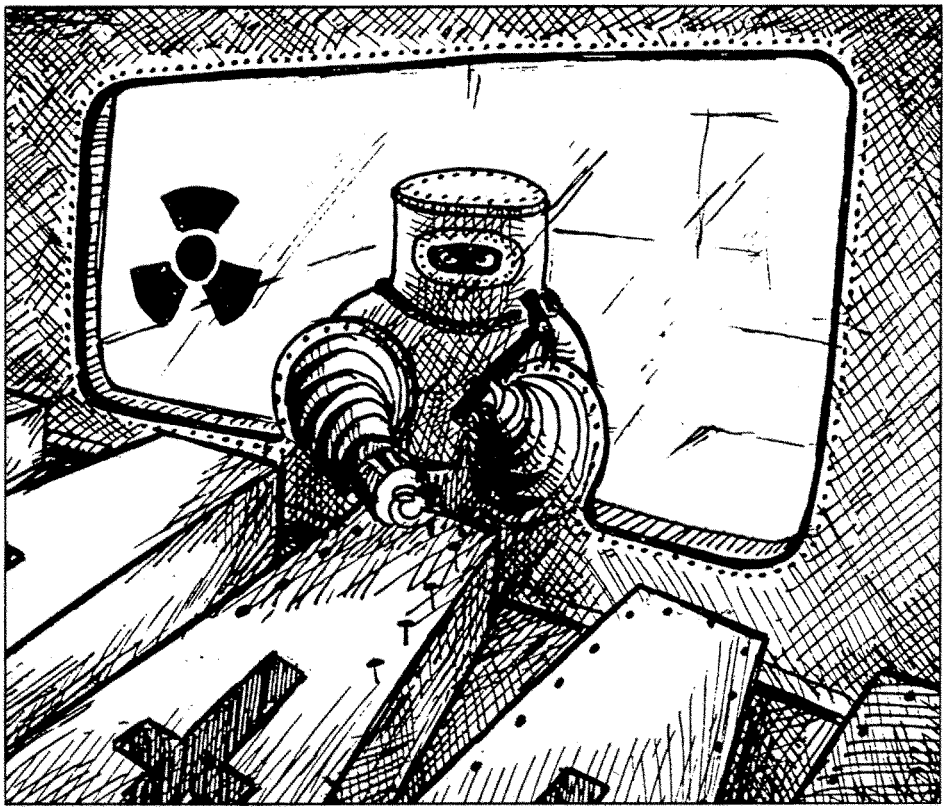
The current NRPB view of a constraint is illogical and seems more like implied criticism of the ICRP's dose limits. The purpose of a dose limit is to prevent workers or members of the public from facing an unacceptable risk. Whereas, exposures at the limit are viewed as just tolerable. At present, the ALARA principle aims to reduce the risk to levels lower than the maximum tolerable. Constraints aim to apply a numerical target to the question 'what is ALARA?'.

The main problem with the NRPB's constraint is that they are derived just like a dose limit! In other words, any exposure in excess of the NRPB's constraints would produce an unacceptable risk, even though the exposure would be perfectly legal because it is less than the ICRP's dose limit.

Intolerable risks

The new ICRP dose limit is 20mSv per year on average (with up to 50mSv in any single year, as long as a limit of 100mSv is not exceeded in any five year period). This has previously been criticised because it would permit workers to face a higher risk than previously considered tolerable (*SCRAM 80*). To maintain the standard of safety as offered by its previous recommendations the ICRP should reduced the limit to around 10mSv (even this is probably not sufficient in light of the new NRPB study).

The NRPB has recommended a constraint for workers of 15mSv per year on average (with no more than 20mSv in any single year). This constraint is based upon a risk of death of 1 in 1,666 per year which is the "maximum that will be tolerated". Yet, under the proposed EURATOM Directive risks in excess of this would be perfectly legal. Is the NRPB really stating that the dose limit should be set at 15mSv and not 20mSv as recommended by ICRP?



Dennis Martin

Furthermore, the NRPB's constraint will allow workers to face a slightly higher risk than it previously considered tolerable. The NRPB first recommended that workers should not be exposed to more than 15mSv in 1987. Yet, at that time, 15mSv was considered to produce a risk of death of 1 in 2,000 per year, which was viewed as the maximum tolerable risk. This risk is now produced by a dose of 12.5mSv (if fatal cancers only are considered and the ICRP's 1991 risk estimate is used).

Ignoring the risk to children

The NRPB's choice of a constraint for members of the public is equally confused. The NRPB now accepts Friends of the Earth's argument that a 1 in 100,000 risk of death from cancer is the maximum that can be tolerated – if standards of safety are to be maintained (*SCRAM 83*). Consequently, the NRPB now recommends that the public should not be exposed to more than 0.3mSv in a year. However, the Board is not recommending a reduction in the public dose limit. Under the EURATOM Directive this will be set a 1mSv. Its 0.3mSv recommendation is only a constraint. Thus, if members of the public receive a radiation dose in excess of this, for instance around Sellafield, Dungeness or Bradwell, little could be done about it as the dose limit will not have been exceeded.

Furthermore, the NRPB has also failed to act on its own 1987 advice that limits for the public must take account of the higher risk to children. The new ICRP recommendations show that risks to children are 2-3 times higher than for adults. The 0.3mSv constraint is based upon an average lifetime risk. For children, using the ICRP figures, a 1 in 100,000 risk of death is produced by a dose of about 0.1mSv. The NRPB should have set a constraint at this level.

Consultation

Consequently, the new NRPB advice if it is not changed, will do nothing to stop the ICRP recommendations becoming law in the UK. It is not good enough for the NRPB to simply ignore the inadequacies of ICRP's dose limits. If the NRPB believes that exposures in excess of 15mSv for workers and 0.3mSv for members of the public produce a risk that is not acceptable, then it must recommend that the ICRP's dose limits be rejected.

The NRPB has invited comments on its response to ICRP (the deadline is 31 March 1992) it is important that as many people as possible write to the NRPB and protest.* □

*** Comments should be sent to:**
Geoff Webb, Board Secretary, NRPB, Chilton, Didcot, Oxon OX11 ORQ

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Barrages under scrutiny

EVIDENCE given by representatives of the large barrage companies to the Commons Energy Committee, shows how Government policies have scuppered progress.

Plans on the Severn and Mersey barrages are fairly well advanced, with construction companies showing their faith in the schemes by providing hard cash.

Crucially, there are discussions going on with environmental groups, who, though not whole-heartedly convinced of the necessity for barrages, are seeking a balance of electricity requirements without the hazards and pollution from conventional generation.

The environmental benefits of obtaining around 8% of English and Welsh electricity requirement from the Mersey and Severn barrages: an annual saving in CO_2 of around 20 million tonnes, SO_2 of 200,000t and NOx of 45,000t; and without producing radioactive waste; were well understood by the companies and politicians. As were the economic benefits to the South West and Merseyside regions which would be stimulated by such projects. The Committee expressed their impatience at the practicalities of securing support and with perceived risks.

Vast sums of money associated with large barrages were considered daunting to potential investors. Recent estimates for the Severn stand at £10.2bn with annual running costs of around £86m. The cost of the Mersey barrage is estimated at £1bn.

Reg Clare, for the Severn Tidal Power Group (STPG), told the Committee that, with the simple assumption of 6p/kWh for the electricity, the pay back period would be 10 years. Inclusion of running costs would add an extra year. With more realistic accounting, including interest charges during construction, and 6p/kWh or 5p/kWh, the companies are expecting a pay-back period of 16.5 or 20 years.

Clare was then asked when the studies might cease and construction commence. Unnecessarily, given the Committees standing, He pointed out that, under conventional economics, with backers looking for their return within 10 years, the scheme would "not go ahead without some Government backing."

Another concern of the Committee was that investors might see barrage schemes as 'ground breaking' and therefore high risk. They suggested that the construction groups might prefer to look into smaller schemes as something "more realistic" to get things moving and allay investors fears by proving the technology. Clare pointed to La Rance in France, Annapolis Royal in Nova Scotia and Kislaya Guba in Northern Russia, to show that the technology is already proven and available today.

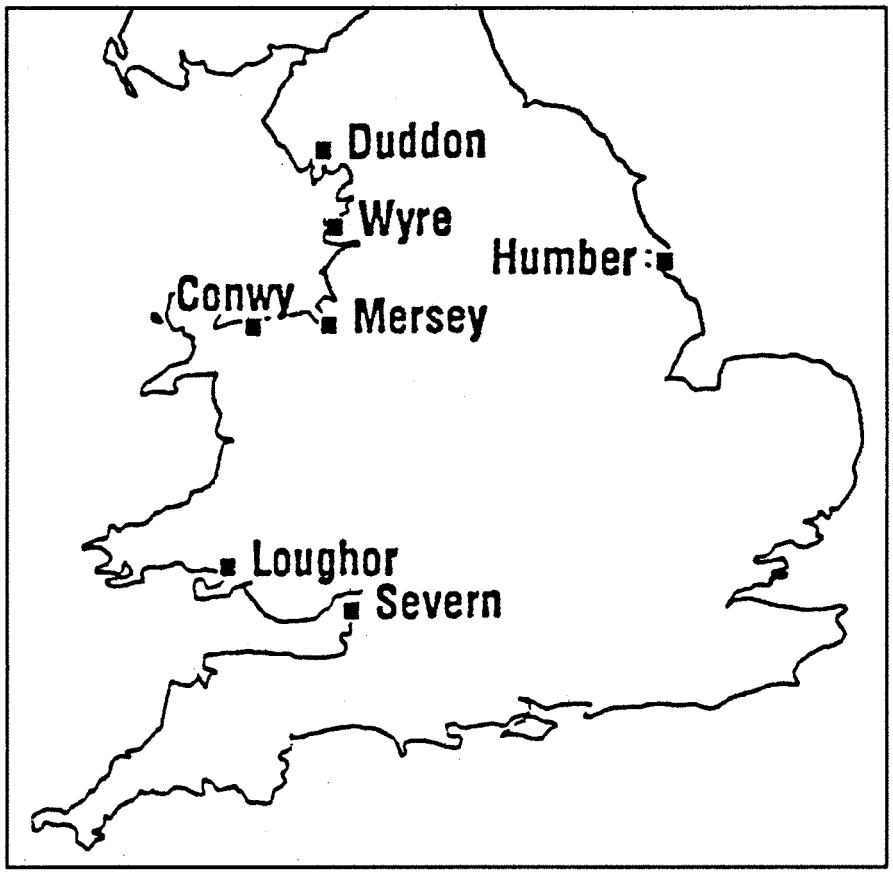
The level of funding necessary for the large barrages are not so unusual, with Torness and Sizewell both costing £2bn. Electricity priced at between 6p and 6.75p would also compare favourably with nuclear electricity generation costs, and barrage schemes would last 4 times as long and have unlimited free feedstock.

Asked if any willingness was detected, on the part of the Government, to assist with the scheme, Clare replied "No", but was "optimistic that a Government will give us some assistance here. I think there is an increasing readiness ... to value the externalities of fossil-fired generation."

Taking a different line from Clare, J McCormack, for the Mersey Barrage Company, argued that the Non-Fosssil Fuel Obligation (NFFO) was the appropriate channel for Government support, and it was merely necessary for the NFFO to be extended, reflecting the time-scale of these projects, for them to take off.

The prospects of private money funding barrage schemes, either large or small, depends on an extension of the NFFO (up to 25 years was suggested) or a greater Government financial contribution.

Until this happens, Committees such as this are meekly reduced to admonishing companies to try harder in finding the money, or suggesting smaller schemes which will serve little purpose. The NFFO structure is a step in the right direction, but what is palpably missing is Government leadership and political will. □



Possible tidal barrage sites under investigation in England and Wales

Power of the wind

A Nordtank 55kW wind turbine in Denmark was totally destroyed in a January storm scattering debris up to 200 metres, highlighting the importance of safe siting.

Running out of control for 2 to 3 hours, the machine was finally halted as, first a blade tip, then a blade and finally the whole nacelle plummeted to the ground. The complete installation, including the tower and foundation was written-off.

The investigating officer, Poul Hojholt, has ascertained that the blade tip flew over the roof of the nearest house some 40 to 50 metres away, and a balance weight crashed through the roof of an outbuilding. The remains of one blade were thrown 200 metres from the tower.

Police had cordoned off an area 500 metres around the turbine while the machine ran out of control and their were no injuries, though the occupants of the nearest house had apparently refused to leave the premises.

One of the owners of the turbine said, "Nobody could imagine the forces which are generated once things go wrong. If it had been possible to unscrew the foundation bolts I wouldn't have been surprised if the whole wind turbine had taken off like a helicopter."

The last such accident, in the gales of January 1990, also involved a Nordtank 55, in that case the turbine was 8 years old. In this case, involving a ten year old turbine, the tip-brakes failed to hold the machine stationary, and are now the subject of further investigation. □

Global warming confusion

RECENT findings by the International Panel on Climate Change (IPCC) suggest that western Europe has experienced slower global warming, compared to the rest of the world, because acid rain inducing sulphur emissions, from power stations, are shielding the region from the sun's heat. It follows that as initiatives to clean up emissions take effect, temperatures will rise.

The announcement has led to conflicting signals in the press which will, no doubt, be used to portray confusion and lack of trustworthiness among scientists and further discredit global warming forecasts.

"Estimates of global warming scaled down" (*Financial Times* (*FT*), January 13); "Experts more certain Earth is warming" (*Guardian*, January 13); "Pace of global warming may be less than thought" (*FT* January 18). Such statements are misleading given that the pollution has only masked the effects of greenhouse gases.

Despite public opinion and European legislators who want preventative action enforced, such statements fuel powerful industrial lobby groups, who see the introduction of taxes to reduce emissions as unwarranted distortion of energy markets.

The Institute of Directors must win the prize for the least helpful contribution in the battle against environmental degradation. Their report, 'Stewards of the Earth' calls on the Government to let companies monitor their own pollution emissions and set their own environmental targets. Government regulation should be used only as a last resort and enforced with a "light touch", according to the report. □

Solar slump

LUZ International, the world's largest builder and operator of solar powered plants, blamed the lack of a 'level playing field', in forcing them into bankruptcy.

The company has built nine plants in California generating 354MW, but can build no more. Luz chairman, Newton Becker said, "The real tragedy is that given a level playing field, Luz could have continued reducing the costs of solar electricity even further, with future projects under construction and on the drawing board. Why does solar energy have to live on a year-to-year basis when the oil, gas, coal and nuclear industries have permanent tax incentives as well as large federal research budgets? It just doesn't make sense when you look at the environmental advantages that solar energy has to offer." □

IPC delays

NATIONAL Power (NP) and PowerGen have now been operating without authorising licenses for 5 months, prompting a protest by Friends of the Earth (FoE) to Environment Secretary, Michael Heseltine.

Authorisation under the Environmental Protection Act, which would have put limits on the generators emissions, should have been granted in August (*SCRAM 83*). A major aim of the new Integrated Pollution Control (IPC) is to maintain public confidence in the system, partly through registers containing information on pollution limits.

The delay is the result of the generating companies having called for exemption from the public registers on the grounds of commercial confidentiality. A letter from NP, leaked to FoE and passed on to the Pollution Inspectorate, shows NP to be concerned that registered information will "enable competitors and suppliers to analyse and assess National Power's operating regime and calculate the effect on National Power's costs". It continues, "We must protect National Power's commercial position against both potential competitors and suppliers."

Despite the importance of the Tory Party's green image in the run-up to an election, they appear to be unhurried in enforcing a decision on the country's main polluters. □

Scottish renewables order

SCOTLAND is to have its own system for funding renewable energy projects starting in 1993, Scottish Office Minister Allan Stewart told the House of Commons Energy Select Committee inquiry into renewables in January.

Some committee members expressed surprise at the size of the order, only between 10 and 20MW compared to the England and Wales NFFO of nearly 500MW.

Stewart had to concede that the order did not reflect the renewable energy potential in Scotland which theoretically has enough wind and moving water to satisfy half of Britain's electricity needs, and was unable to say how long the order would last, but he closed the door on expanding it because of surplus generating capacity in Scotland.

The Scottish Secretary, Ian Lang, is to hold talks with Scottish Power and Scottish Hydro-Electric to work out the details of implementing the obligation which will require the utilities to purchase the renewables output.

The length of the order will probably be related to the outcome of negotiations with the European Commission to extend the NFFO for England and Wales.

Colin Moynihan told the committee that options included offering fixed-length contracts for 12 or 13 years with different funding systems for different renewable technologies. □

Power from nature

A renewable energy exhibition will open at the Collins Gallery, Glasgow on March 28 and run until April 25, after which it is hoped it will tour Scotland.

Interactive displays of the array of renewable technologies will be explored in conjunction with latest conservation developments in the home.

Projects from a schools innovative renewable technologies design competition will be on display and there will also be a full education and events programme, including workshops, films and lectures.

The Collins Gallery is at the University of Strathclyde, 22 Richmond Street, Glasgow G1 1XQ. Tel 041 552 4400 ext 2682.

Coal collapse

BRITISH Coal (BC) and the Department of Energy (DoEn) are to wind down their 'Clean-coal' fluidised bed combustion project at Grimethorpe.

BC claimed that the trials, which have cost £27 million, have achieved their "prime objectives", but Frank Dobson, Labour's energy spokesperson, described it as "the death knell for energy research" and John Meads, general secretary of the British Association of Colliery Managers said its closure was "far too premature".

Grimethorpe was leading the way with the experimental "topping cycle" technology (*SCRAM 82*). By using combined fluidised bed combustion, with a pressurised coal gasifier, before passing through a new generation of gas turbines, the plant would improve overall efficiency by up to 20% on pulverised fuel plant fitted with flue gas desulphurisation equipment.

Back in November 1989 (*SCRAM 73*) Steve Dawes, BC Power Generation Research Manager, talked to SCRAM with considerable optimism for the future of this technology.

BC and the (DoEn) will contribute £4m and £1m respectively to wrap the project up.

A working party has been formed to investigate the commercial prospect for the technology, with the possibility of building a demonstration plant, to be paid for by private interests at an estimated cost of around £100m.

The Government has been criticised in the past by the Energy Select Committee for its "stop-go" funding for clean-coal and for not backing this leading technology with sufficient capital. □

Stepping on the gas

A UK gas import ban has been lifted following concerns over future shortages and pressure from the European Commission to liberalise the internal energy market, but the move is being portrayed as the Government's enthusiastic pursuit of free markets.

In the reversal of a long standing opposition to gas imports, Energy Minister Colin Moynihan told the Commons "A market in which gas moves freely across frontiers and competes its way freely to final consumers provides the best assurance for all ... of the continuous development which will bring the environmental attractions of gas within the reach of the widest public."

Such enthusiasm seems over stated given the long standing resistance to imports from Norway. The planned imports are not considered sufficient to meet the UK shortfall, which will occur in 1994, yet the Secretary of State for Energy, John Wakeham, has described the cross-Channel gas line as an opportunity for export of UK gas to the continent. In reality, it will more likely provide access to the UK for cheap Russian gas.

The 'free market' to be created will be subject to Government control on volumes to be imported and the parties involved. Anyone with delusions of free market intent should note Wakeham's own statement in December. "The thing I want to dispel is that we believe you can just leave these things to the free market. You can't. You have to create a free market if you want one." □

Grid UK

RADICAL plans are proposed by the Labour Party for meeting its commitment to "take control" of the National Grid Company (NGC) when in government.

Labour has said it is prepared to give up all, or part, of the 40% government holding in National Power and PowerGen in return for shares in NGC, thus preventing accusations of extravagant spending from the Tories.

One option is a share swap with the 12 regional electricity companies, who all have a stake in the NGC. This would also reintroduce the financial link between electricity distributors and generators - vertical integration - essential for the promotion of energy conservation.

Alternative options include the exchange of the £2.4bn debt owed to the government by the regional electricity companies for sufficient equity in the grid to exert control.

Labour have again attacked electricity privatisation as "a legalised racket" and projected this years combined profits from 16 electricity companies - including PowerGen, National Power, NGC and Nuclear Electric - to total more than £3.4bn. □

Wind farm first

BRITAIN'S first wind farm, at Delabole in Cornwall, has survived its initiation - by fire - when the blades of one of the Danish Vestas turbines were destroyed by a freak bolt of lightning.

Only two such accidents have been recorded among Denmark's thousands of wind turbines in the last 10 years.

The wind farms owner, Peter Edwards, said "There was just one enormous clap of thunder and all the lights went out for a four or five square miles - not that it had anything to do with the wind farm of course."

He said he was more impressed by the performance of the turbines, which "stopped instantly" in the force 8 gale and that they have "generated more than double the earnings we have calculated should be the average for a whole month", despite being geared down 100kW to 300kW.

Power from the 10 turbines is being bought by the South Western Electricity Board at 10p/kWh rising to 11p/kWh on a short term contract. It is not clear what price will be offered after the 1998 NFFO expiry date. Edwards is hoping for the farm to pay for itself within the next 6 years, "It's looking good", he enthused.

Planning permission for the wind farm was originally refused by North Cornwall District Council because of fears over noise pollution (*SCRAM 75*), but as Edwards commented "noise should no longer be an issue here in England now that people have come and heard them first hand." □

Grid Europe

SAVINGS of "tens of millions of Secus", to EC energy users, are being suggested if plans for an internal energy market gains approval from member states.

Only the largest users - those using more than 25 million cubic metres of gas or 100GWhours of electricity a year - namely the steel, aluminium, chemical, glass and fertiliser industries will benefit.

Domestic bills will not drop and may even increase to pay for investments necessary to supply the large industrial users. □

REVIEWS

Uranium Mining in Australia
Edited by Claire Gerson and Steve Broadbent.

Movement Against Uranium Mining (NSW); July 1991, 16pp.

This booklet is a welcome update of the first edition published in 1984, which became a cornerstone of the uranium debate in Australia. Despite its title, the booklet also draws heavily on experiences in North America, and to a lesser extent East Germany. When the nuclear industry in the UK talks of their compact fuel, and compare it to trainloads of coal, what they neatly overlook is the trail of devastation caused producing their fuel in the first place; this booklet details that devastation.

As a typical example, the Ranger mine in Australia's Northern Territory produces between 3,100 and 3,600 tonnes of uranium oxide annually, resulting in one million tonnes of 'tailings' (radioactive sand like waste). "Uranium tailings contain 80% of the radioactivity of the original ore ... and will require containment for hundreds of thousands of years."

The different mining process - open-cut, underground or in-situ leaching - each have their own environmental and health risks, to mine workers and to the surrounding community.

"A study done of the Register of Deaths shows that 40% of those who worked underground at the Radium Hill mine [Australia's first uranium mine] in South Australia have died of lung cancer."

And "a two-year preliminary study of Navajo Indians in the western US found an unusually high number of birth defects, including hydrocephaly, microcephaly, Down syndrome, cleft lip, cleft palate, and epilepsy among more than 500 babies born between 1967 and 1974. The area around the Navajo Nation is marked by more than 350 abandoned open-cut uranium mines."

In-situ leaching involves forcing acidic solution through the orebody to dissolve the uranium. With "the constant threat that the noxious solution of sulphuric acid, oxidant, uranium and heavy metals will end up in water supplies, which is what happened with ISL mines in the US."

Uranium Mining in Australia takes you from the mining activities, the effects on workers, the surrounding community and the general environment, to military connections and political opinion. The report ends with details on ten mines, only two of which are producing - the others are mined out or seeking and/or refused an operating licence.

With the currently depressed uranium market - Energy Resources of Australia, owners of one of the two working mines, recently made 126 of its 302 employees redundant (*Safe Energy 86*) - and there is growing pressure in Australia for an end to uranium mining. The environmental dangers should not just be of concern to producer countries, but also to countries like Britain which buy the product.

As Chief Seattle of the Suquamish tribe in North America, quoted on the front cover, said in 1854:

"Whatever befalls the earth, befalls the people of the earth. We did not weave the web of life, we are merely strands in it. Whatever we do to the web, we do to ourselves."

GRAHAM STEIN

REVIEWS

Generating Pressure: The campaign against Nuclear Power at Druridge Bay; by Bridget Gubbins.

Earthright Publications; 1991; 160pp; £4.95.

Druridge Bay Campaign (DBC) is an eighties success that is not withering in the nineties. Born of a time which eschewed political activity in favour of personal gain, its story is one of growing environmental awareness – part of the groundswell in a movement which is now too large to be ignored.

Over the last 13 or so years people have not forgotten the shock they felt upon hearing of the Central Electricity Generating Board's plans for their coastline. Druridge Bay is a "glittering expanse of the North Sea [with] miles of golden sands and the brilliant skyscapes are loved by thousands of people." It is the closest beach for Tynesiders who seek solitude or a natural environment.

Bridget Gubbins, DBC's press officer, offers us more than a straight documentary of the key events in the groups development, through the words of activists she has produced a valuable insight into the dynamics of environmental awareness. From the early 'what are we going to do' and 'how can we possibly fight something as large as the CEGB', objectors soon realised the priority of providing quality counter information and the value of the press. What is often surprising in environmentalism is how quickly a novice in a subject can progress to fighting a campaign using the developers arguments against them. How quickly self confidence can grow. This is just such a story.

Over the years the Campaign has had its high and low points, ebbs and flows in energy. From the CEGB's declaration of intent in 1978; through the silent years to 1982 when Druridge won itself a place in the lottery for one of 10 proposed shiny new PWR's; past 1984 when the area was dubbed suitable for two stations; covering the chaos of Chernobyl; and into privatisation: DBC have capitalised on every aspect of the debate, keeping awareness of the threat alive.

Sometimes, Gubbins notes, "Campaigners find it difficult to sustain themselves when there is no visible enemy." It is just at the point when the campaign grinds to a halt through a lack of any tangible new development to provide the rush of campaigning adrenalin, that the developers are likely to move in. This will not be the fate of Druridge Bay. DBC have insured that Nuclear Electric, inheritor of the CEGB's nuclear interests, cannot creep back unnoticed.

The book also provides a very useful introduction to the issues surrounding the nuclear debate, from radiation and health to decommissioning and alternative energy sources. Its lessons are relevant to any new campaigning group, not just those concerned with nuclear power. It should be amongst the first books bought for any environmental library.

MIKE TOWNSLEY

Available from Druridge Bay Campaign, Tower Buildings, Oldgate, Morpeth, Northumberland NE61 1PY.

ABSENT ACTIVIST

Would anyone knowing the current whereabouts of George Hancock, late of Portskewett and its nuclear inquiry, or possessing any clues to same, please contact Dr D G Arnott, Rhiewport Hall, Berriew, Welshpool, Powys, Tel. 0686 640203, or via SCRAM.

LITTLE BLACK RABBIT

Bulb scam

The USA is the home of Least Cost Planning and it is not unknown for electricity utilities to give away low energy light bulbs. This idea has spread north to Ontario Hydro who have sent two "energy saving bulbs" to all their customers to replace 60W incandescents. The replacement bulbs turn out not to be 15W compact fluorescent bulbs but 52W incandescents.

Unimpressed by this "public relations scam", Greenpeace activists in Toronto delivered 700 pounds of coal to the door of Ontario Hydro Chairperson Marc Eliesen. The coal represented the amount of fuel that could be saved by a single genuinely low energy bulb during its lifetime. Alternatively they could have sent the Chair of the pro nuclear utility 15 pounds of radioactive waste.

Caught short

English and Welsh electricity consumers rely on the National Grid Company to ensure supply and distribution of their electricity. A worrying memo, therefore, has been circulating the company's HQ, National Grid House: "It is necessary that staff minimise their electrical demands. Of particular concern are the use of electrical heaters and kettles in offices. Their use puts a considerable strain on supplies. One 3kW kettle uses the same electricity as the lighting to a complete wing of the building. Please help us to keep the building running by turning off heaters and not using kettles."

Consumers in England and Wales must hope that the consequences of 40 year old, unmaintained wiring in National Grid House are not an omen for the Grid itself.

Missing

Against the background of the missing 10kg of Uranium which Dounreay management had written off as largely an accounting error, a recent meeting of Highland Regional Council met in Inverness to consider a report on reprocessing at Dounreay. 400 Dounreay workers were being paid to be bused to Inverness to protest outside the meeting, so anti-nuclear campaigners were surprised when arriving for the meeting that the demonstrators unlike their fleet of buses, were nowhere to be seen. On hearing the explanation for their absence – the bus with the placards had gone missing – Lorraine Mann of Scotland Against Nuclear Dumping was heard to remark "Don't worry, it's probably just an accounting error."

Lap-dog

St. Bernard (Sorry, that's Sir Bernard) Ingham made his name as the off-the-record mouthpiece of Mrs Thatcher. Having left the civil service, Sir Bernard now has a vehicle for his own opinions, as a columnist with the Daily Express. A former under secretary at the Department of Energy – working for Tony Benn – Ingham feels qualified to pontificate on energy matters at regular intervals in his Express column. He has dismissed wind power "nasty blots on the landscape" and wave power "unreliable and unbelievably costly"; and disparaged anti-nuclear groups: the "hilariously named" Friends of the Earth, and "Greenwar". Nuclear power, however, according to the wisdom of Sir Bernard, is "reliable, concentrated and competitive".

Ingham has received his reward for defending nuclear power; as yet another supplement to his civil service pension, 'he has become a part-time advisor to British Nuclear Fuels.

Bulgarian Beadle

Just before Christmas, Bulgarian television reported an accident at the Kozloduy nuclear plant on the Danube. A state TV announcer told of troops surrounding the plant and trucks carrying concrete. The plant, plagued by fire and radioactive leaks, has been condemned by experts as unsafe, and the report caused panic in the Kozloduy area. However 50 minutes after the announcement, the TV station revealed that the report had just been a Christmas prank – good to see the Bulgarians making the most of their new found reporting freedom.

And finally: Morcombe's 30 piece Silver Band have new sponsors – Nuclear Electric. Need we say more.

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1 I would like to **subscribe** to the **SCRAM Safe Energy Journal**, and I enclose an annual subscription fee of:

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