# 1985

# Nuclear Power, Nuclear Weapons: The Deadly Connection

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## Summary:

Campaign for Nuclear Disarmament pamphlet arguing that nuclear power and weapons are inseparable and this inseparability leads to the constant violation of the Non-Proliferation Treaty, which must be severely strengthened to avoid nuclear war.

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ROB EDWARDS

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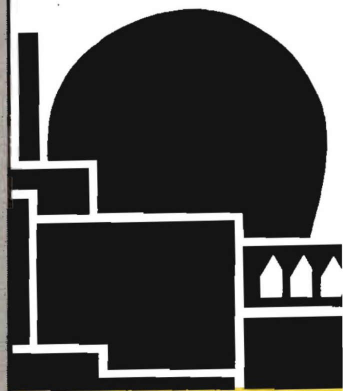

CND Publications

ROB EDWARDS

# NUCLEAR POWER NUCLEAR WEAPONS

# THE DEADLY CONNECTION



CND Publications

**Rob Edwards** is a journalist with the *New Statesman* and was co-ordinator of CND's case at the Sizewell Inquiry.

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I am indebted to the work and support over the last three years of the following: Jennifer Armstrong, Keith Barnham, Fred Barker, John Bowyer, Ross Hesketh, Colin Hines, David Lowry, Fiona Riddoch, Dave Wainwright and Tim Williams.

**Rob Edwards, August 1985**

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## Information Boxes

# Introduction

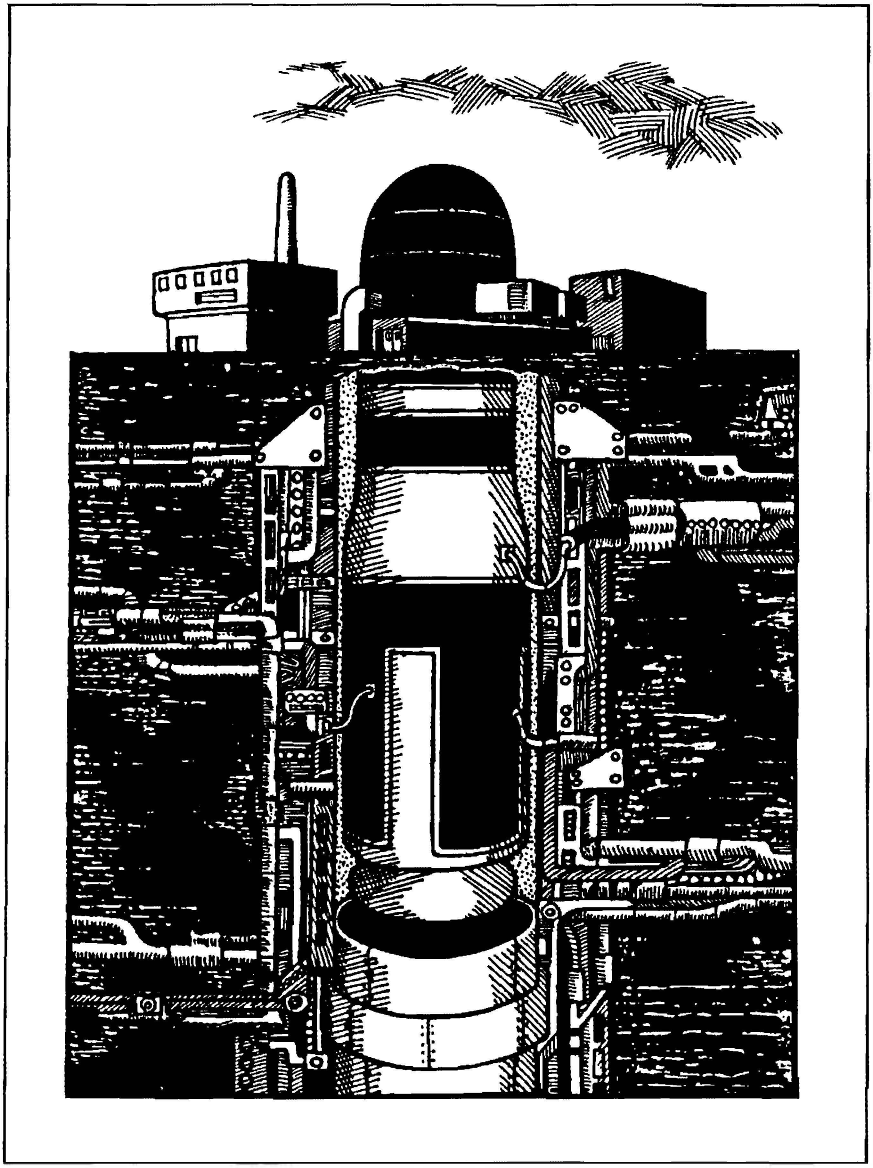
*There is confusion between nuclear power and nuclear weapons . . . There is no more connection between the generation of power in a nuclear power station and nuclear weapons than there is between a conventional power station and conventional weapons.*[1]

That is what the then Energy Secretary Nigel Lawson told the House of Commons press gallery lunch in January 1983. That a government minister should spread such falsehoods is alarming. Either Nigel Lawson believed what he said, in which case he was startlingly ill-informed, or he knew the truth and was knowingly misleading the British public. Denials of the connections between nuclear power and nuclear weapons have been persistently used to protect Britain's ailing nuclear power industry and to deceive the public. Pretending that there are no connections has undermined all international efforts to control the spread and stockpiling of nuclear weapons.

This pamphlet makes the connections clear – it explains the truth about the intimate relationship between nuclear power and nuclear weapons; it reveals the truth about the misuse of civil plutonium for military purposes, and shows how nuclear power increases the risk of nuclear war. The aim is, once and for all, to nail the 'Atoms for Peace' lie and to make sure that never again can anyone pretend, like Nigel Lawson pretended, that there is no connection between the civil and military uses of the atom.

Some of the facts recited here are not new. Others have only recently been uncovered, mostly as a result of the Campaign for Nuclear Disarmament's work at the Sizewell B Public Inquiry. There are still murky areas where official secrecy or conflicting information prevent categorical conclusions. No doubt further facts will emerge in time. Nevertheless the startling revelations of the last few years have greatly enhanced our understanding of the issues, making it important to set out precisely what has been learnt for the benefit of a wider audience.

The pamphlet is divided into four parts. In **Part 1** there is a short history of the development of nuclear power and nuclear weapons, concentrating on the technical and institutional relationship between the two. **Part 2** describes how the export of nuclear power technologies aids the spread of nuclear weapons – known in nuclear jargon as horizontal proliferation – and illustrates the ineffectiveness of the international safeguards meant to prevent this from happening. **Part 3** analyses how nuclear power has fuelled the nuclear arms race in Britain and America – known as vertical proliferation. It recounts the problems of secrecy and misinformation and exposes the farce of the safeguards supposed to be applied in Britain. **Part 4** briefly summarises what has been said and links it to the controversy surrounding the Nuclear Non-Proliferation Treaty, arguing for a long term strategy of phasing out nuclear power as well as nuclear weapons.



# The Development of Britain's Nuclear Programme

Nuclear power stations, using the heat created by the controlled fission of uranium or plutonium, are a method of generating electricity. Nuclear weapons, based either on the fission of uranium or plutonium (A-bombs) or on the fusion of forms of hydrogen (H-bombs), are a means of making massive explosions. The development of both only began in earnest during the Second World War, when the governments of Britain, America and Canada worked together on the Manhattan Project. Although the primary purpose of the project was to make atomic bombs – two of which were dropped on Japan at Hiroshima and Nagasaki in 1945 – it provided scientists with much information vital for the development of nuclear power.[1]

Immediately after the war atomic collaboration between Britain and America broke down, and the British Government secretly started work on its own atomic bomb programme. A team of top scientists, many of whom had worked on the Manhattan Project, were engaged by the Ministry of Supply to create the foundations of Britain's many-tentacled nuclear industry. An engineer from Imperial Chemical Industries (ICI) called Christopher (later Lord) Hinton was given the responsibility for co-ordinating the design, construction and operation of all the facilities to produce plutonium for Britain's envisaged nuclear weapons.

Between 1946 and 1952 Hinton's team of designers and engineers constructed a nuclear fuel fabrication plant at **Springfields** near Preston, a uranium enrichment plant at **Capenhurst** near Chester, and two small plutonium production reactors (or piles) and an associated reprocessing plant at **Windscale** in Cumbria. The first Windscale pile began operating in October 1950, the second in June 1951. The first plutonium was extracted in February 1952 and sent to the weapons establishment at Aldermaston near Reading in August. This was then used in Britain's first atomic bomb which exploded at Monte Bello, off the northern coast of Australia, on October 3, 1952.

A-bombs can be made with plutonium which contains a high proportion of the plutonium 239 isotope, or with uranium which contains a high proportion of the uranium 235 isotope (i.e. highly enriched uranium). (Highly enriched uranium is also used to fuel the reactors that drive the Navy's nuclear-powered submarines.) Most atomic bombs have probably been made from plutonium,[2] but by 1956 Capenhurst was producing highly enriched uranium for bombs, including the atomic 'trigger' for Britain's first H-bomb tested in 1957.

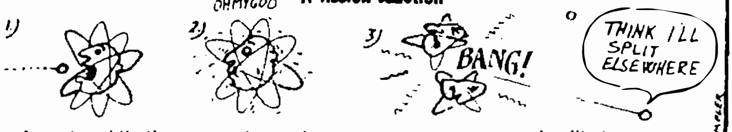
In 1952 the British military establishment decided to develop a long range nuclear bomber force and pointed out that the two Wind-

## Nuclear bombs

**A-bomb** is the popular name for a fission bomb of the type dropped on Japan by America in 1945. An atomic explosion is an uncontrolled nuclear chain reaction which occurs when the nuclei in an unstable mass of nuclear material split up, releasing vast quantities of energy.

There are two main nuclear explosives—the uranium 235 isotope which was used in the Hiroshima bomb and the plutonium 239 isotope which was used in the Nagasaki bomb.

**A fission reaction**




A neutron hits the nucleus of a uranium atom... ...the nucleus absorbs the neutron but becomes unstable... ...and splits in two, releasing some energy +2 or 3 new neutrons...

**The release of fresh neutrons opens up the prospect of a CHAIN REACTION...**

**H-bomb** is the popular name for a fusion or thermonuclear bomb which uses a fission bomb as a detonator. The fission explosion generates the extremely high temperatures at which isotopes of hydrogen, such as deuterium and tritium, fuse together in an uncontrollable way to make an explosion up to 1000 times more powerful than a fission bomb.

scale piles would not produce enough plutonium for such a purpose. It demanded the doubling of production over the next three years. As a result the Government eventually agreed to build eight new 'Magnox' reactors, which would have the novelty of generating electricity as a by-product.

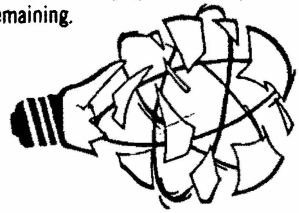
Four reactors at **Calder Hall**, adjacent to Windscale, were officially opened by the Queen in October 1956, without a mention of their crucial military role. A further four reactors at Chapelcross in Dumfriesshire in Scotland were opened in May 1959. Both sites were run by the **UK Atomic Energy Authority** (UKAEA) which had been established in 1954 to oversee all nuclear activities. **British Nuclear Fuels Limited** (BNFL) was hived off from the UKAEA in 1971, taking with it responsibility for Calder Hall and Chapelcross, as well as Windscale, Capenhurst and Springfields, all plants with significant military activities. In 1981 all but one of BNFL's shares were transferred from the UKAEA to the Department of Energy. It was not until 1973 that responsibility for the Aldermaston weapons establishment was transferred from the UKAEA to the Ministry of Defence.

From the military's point of view, it was just as well that Calder Hall and Chapelcross were beginning to provide plutonium for weapons, for in 1957 Britain's worst nuclear accident caused both the Windscale plutonium-production piles to be permanently shut down. A fire in one of the piles resulted in serious radioactive pollution of the surrounding area and three million gallons of contaminated milk being poured into the sea. Until any more reactors were built, Calder Hall and Chapelcross were the only possible source of plutonium for Britain's growing nuclear weapons stockpile.

In 1955 the government announced a plan to build four more Magnox stations, later expanded to a total of nine such stations in Britain. Although they were to be run by the electricity boards – the Central Electricity Generating Board (CEGB) and the South of Scotland Electricity Board (SSEB) – these stations were very similar in design to Calder Hall and Chapelcross. There was one important difference, though, that would actually make it easier to use the electricity board reactors to produce plutonium for weapons – they were designed to be refuelled while they were still running (a process known as on-load re-fuelling).

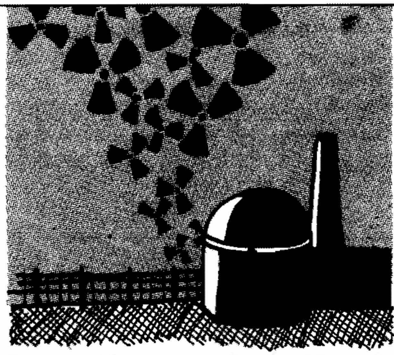
## Plutonium production

The **burn-up** of uranium reactor fuel determines the isotopic composition of the plutonium produced. As the fuel is burnt up, nuclei of uranium are converted into plutonium 239. If the fuel remains in the reactor for long enough, other isotopes of plutonium, such as plutonium 240, are also produced. Then the longer the fuel is in the reactor (i.e. the higher its burn up), the lower is the proportion of plutonium 239 remaining.



On-load refuelling—the ability to remove and insert fuel rods while a reactor is running—makes it easier to control the burn-up of fuel and hence to produce plutonium containing high proportions of the plutonium 239 isotope.

**Reprocessing** is the difficult and expensive chemical process by which the plutonium in the spent fuel from nuclear reactors is separated



from unused uranium and radioactive waste products. The spent fuel from Magnox reactors is currently reprocessed in a plant at Windscale in Cumbria, but the spent fuel from advanced gas-cooled reactors and any pressurised water reactors cannot be reprocessed until a new thermal oxide reprocessing plant is built.

**Reactor-grade plutonium** typically contains in the region of 50-80 per cent of the plutonium 239 isotope, a proportion that depends on the type of reactor and its fuel burn-up.

**Weapons-grade plutonium** typically contains more than 90 per cent of the plutonium 239 isotope. Between two and ten kilogrammes of plutonium 239 are necessary for a fission bomb.


If uranium fuel is left in the reactor for a fairly short time (it has a low 'burn-up'), plutonium with a relatively high proportion of the plutonium 239 isotope – the preferred material for bombs – is created. On-load refuelling allows much more flexibility in the way reactors are run and makes it easier to use them to create this kind of weapons-grade plutonium. If the fuel is left in the reactor for longer the plutonium becomes more inconvenient for nuclear weapons. In addition all Magnox reactors will inevitably produce perhaps three-quarters of a tonne of weapons-grade plutonium in their first two years of operation as some of the fuel is withdrawn early to allow refuelling to be staggered. The same will apply when the reactors eventually come to be closed down.

In 1958 it was revealed that the CEGB had been asked to modify the design of the refuelling machinery of three of the planned Magnox power stations to make it even easier to obtain weapons-grade plutonium from them. At the time the government described the plan as 'a most valuable insurance against future possible defence requirements'.[3] A year later the government changed its mind and said that only one station, that planned for Hinkley Point in Somerset, would in fact be modified.[4] In 1981 the government insisted that, in spite of the modifications, Hinkley Point had never been used to produce weapons-grade plutonium.[5] There are good reasons, as we shall see, to doubt this reassurance.

In 1963 the production of bombs-grade uranium at Capenhurst appears to have halted, though details of what has happened since are sparse. It is known that a new £100,000,000 military enrichment plant was due to be completed by BNFL for the Ministry of Defence at Capenhurst in 1985.[6] The initial plan was for the new plant to enrich uranium to an 'intermediate level' and then to send it to America for 'high level' enrichment to take place, with the longer term aim of achieving full high-level enrichment at Capenhurst.

In 1964 there was also a lull in the British military's demand for plutonium.[7] The Calder Hall and Chapelcross reactors were said to have then been 'optimised' for electricity production, creating the impression that they were not subsequently used for weapons production. But it was revealed at the Sizewell B Public Inquiry that this was not the case.[8] In 1985 the Prime Minister Mrs Thatcher explained the situation to Parliament:

> *Defence plutonium production was stopped for a period subsequent to the then Prime Minister's statement on 21 April 1964 and following the fulfilment of defence requirements. There has been one subsequent period of production in response to a further defence requirement. It would not be in the national interest to give details of future production of plutonium, which will be kept at the minimum level required to meet defence needs.*[9]

In other words Calder Hall and Chapelcross – run by BNFL to pro-

## Enrichment

Uranium is found in nature containing only 0.7 per cent of the uranium 237 isotope. Some reactors, such as the Magnox, use natural uranium in its metallic form as fuel. However, before it can be used as fuel in other reactors, such as the advanced gas-cooled reactor (AGR) or the pressurised water reactor (PWR), or as an explosive in a fission bomb, the proportion of the uranium 235 isotope must be increased.

This is done by the physical process of **enrichment** which utilises the very small differences in mass between the isotopes of uranium. The difference is so small that enrichment plants have to be very large, expensive and energy consuming.

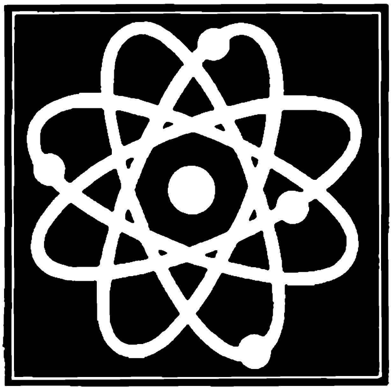
The AGR and PWR are fuelled by low enriched uranium containing about 2.3 per cent of the uranium 235 isotope. About 20 kilogrammes of highly enriched uranium, containing more than 90 per cent of the uranium 235 isotope, are needed to make a fission bomb. Highly enriched uranium is also used to fuel nuclear-powered submarines.

**The massive Capenhurst enrichment factory run by BNFL in Cheshire.**

## Isotopes

**Isotopes** are different forms of the same elements. They have the same number of protons in the nucleus of atoms as other varieties of the element, but a different number of neutrons. They are usually labelled by the total number of protons and neutrons they contain.

Thus uranium 235 is an isotope of uranium with 92 protons and 143 neutrons, and plutonium 239 is an isotope of plutonium with 94 protons and 145 neutrons. Deuterium is an isotope of hydrogen with one proton and one neutron, and tritium is an isotope of hydrogen with one proton and two neutrons.




duce around 3,000 million units of electricity every year for the national grid – are still key parts of Britain's nuclear weapons programme. They have provided plutonium for warheads in the recent past and are likely to do so again in the future for any new weapons systems. Since the completion of new tritium production and separation facilities there in 1980, Chapelcross has also become Britain's only indigenous source of tritium, an essential ingredient of H-bombs.

## Trident

If the British Government's plan to acquire the submarine-launched Trident missile system goes ahead, nearly 900 new nuclear warheads will be made in Britain. The plutonium and tritium necessary for these weapons is very likely to be created by Calder Hall and Chapelcross at the same time as they are providing electricity for consumers. The highly enriched uranium needed to fuel the nuclear reactors that will power the four envisaged Trident submarines is likely to come from the new enrichment plant at Capenhurst. Highly enriched uranium from Capenhurst could also be used in Trident or other warheads. Some or all of this uranium will probably have originated in Rio Tinto Zinc's mine in South African-occupied Namibia, and will have been bought by Britain in defiance of international law.[10]

## Nuclear Co-operation Between Britain and America

It is in this context that it is important to examine the swops of nuclear explosives ('fissile material') that have taken place between Britain and America. The post war freeze on nuclear co-operation between the two countries began to thaw in 1955 with the conclusion, amongst others, of an *Agreement... for Co-operation on the Civil Uses of Atomic Energy*. Collaboration was extended to include military nuclear activities in 1958 with the publication of the *Agreement... for Co-operation on the Uses of Atomic Energy for Mutual Defence Purposes* and its amendment in 1959.[11] This agreement formed the basis for what became known as the 'special relationship' between Britain and America on nuclear defence.

*The Mutual Defence Agreement* as amended is the agreement under which the British and American governments jointly test nuclear weapons in the Nevada desert.[12] Crucially, it also allows America to send its highly-enriched uranium and tritium to Britain for use in nuclear submarines and warheads in exchange for British plutonium for American weapons. It has been constantly renewed, most recently in 1984 to last until the end of 1994.[13] Many of the details of the swops that have taken place under the agreement are obscure, but several salient facts are known. Plutonium from Calder Hall and Chapelcross has, according to official sources, always formed part of the exchanges.[14] The supply of tritium for H-bombs from America presumably decreased or ceased following the completion of the new tritium facilities at Chapelcross in 1980. The planned start-up of the new military enrichment plant at Capenhurst in 1985 will obviously affect the amount of highly-enriched uranium likely to be received from America.

More controversially, it is now known that plutonium produced in electricity board reactors between 1964 and 1971 was sent to America under the Mutual Defence Agreement. In spite of the fact that it went under a specifically military agreement, the Government and nuclear industry now claim that the exported plutonium has been used entirely for civil purposes, mainly in fast reactor research.[15] As we shall see, their claims are – to say the least – debatable.

## International Safeguards

The international safeguards regime is meant to detect and deter the diversion of civil nuclear technologies and materials for weapons purposes. Today's non-proliferation effort can be traced back to the American President Eisenhower's famous 'Atoms for Peace' speech in 1953, in which he launched a massive programme of nuclear exports. His country's aim was, he said,

> *To help solve the fearful atomic dilemma – to devote its entire heart and mind to finding the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life.*[16]

This illusory vision can be blamed for most of the ensuing problems.

The main world non-proliferation organisation, the **International Atomic Energy Agency** (IAEA) was set up in 1957. Its aim was to 'spread the benefits of nuclear technology' while at the same time trying to deter its use for military purposes by administering a system of international safeguards.[17] Based in Vienna, it employs a team of inspectors (120 in 1981) to check that countries are doing what they say they are doing. This involves a special system of nuclear materials accountancy, the checking of written records and, crucially, the physical inspection of nuclear facilities. IAEA inspectors can install video cameras and tamper-proof seals, as well as collecting and testing material samples, in order to detect whether any illicit activities have taken place. In 1983 1,840 inspections were carried out on 520 nuclear installations throughout the world. Exactly 100 tonnes of plutonium was subject to safeguards in states without nuclear weapons.

## The Nuclear Non-Proliferation Treaty

In 1970, sponsored by Britain, America and the Soviet Union, the Nuclear Non-Proliferation Treaty (NPT) entered into force. With 127 countries party to the treaty by the summer of 1985, there is no doubt that it has become the most important international agreement aimed at preventing the spreading and stockpiling of nuclear weapons. Most IAEA safeguards agreements are now administered under the auspicies of the NPT. In Common Market countries, EURATOM, the European Atomic Energy Community, operates NPT safeguards in conjunction with the IAEA.

The NPT is in essence a bargain between states with nuclear weapons and those without them. By promising not to develop nuclear weapons (*Article* II), the non-nuclear weapons states gain the 'inalienable right' to develop civil nuclear power and expect every assistance in doing so (*Article* IV). They have to agree to submit their nuclear facilities to 'full-scope' IAEA safeguards to verify that no diversion for military purposes takes place (*Article* III). In return, they expect the nuclear weapons states, in accordance with *Article* VI, to disarm. Unfortunately this is a promise that the nuclear weapons states have palpably failed to keep.

As we shall see, the NPT has not prevented proliferation, although it has been credited with slowing it down. It seems to have played an important political and psychological role in deterring countries from developing nuclear weapons, or at least from admitting that they have developed weapons. But, like all the other major efforts to stem the spread of nuclear warheads, it rests on a false assumption: that it is possible to maintain a complete and verifiable distinction between civil and military nuclear activities. At the same time as encouraging the spread of 'civil' nuclear technology and materials, it attempts to control the spread of 'military' nuclear technologies and materials. The problem is that they are very often one and the same.

# 'Horizontal' Proliferation

*The development of atomic energy for peaceful purposes and the development of atomic energy for bombs are in much of their course interchangeable and interdependent.*[1]

This was one of the conclusions that a distinguished group of American scientists and politicians reached in the Acheson-Lilienthal report published in 1946. Since then, America, Britain, and the Soviet Union have all developed nuclear power on the back of their nuclear weapons projects. It has also happened the other way round. A nominally civil nuclear programme in France ended up with the country gaining its own nuclear weapons.[2] India received vital assistance to its 'civil' nuclear programme from Canada and America, and exploded a 15 kiloton nuclear device in 1974 in the Rajasthan desert near Pokharan. The so-called civil nuclear projects in the 'near-nuclear' countries – those like Argentina, Israel, Pakistan and South Africa, which are thought to be able to make nuclear weapons if they wish – have received vital aid from nuclear exporters like America, Germany and France. Any country which gains the means to create plutonium in a nuclear reactor, and to separate it in a reprocessing plant, is only a few weeks, perhaps days, away from having nuclear warheads ready to explode.

In recent years, especially since the American Three Mile Island reactor accident in 1979, the international nuclear market has contracted. So exporters have become more prepared to relax the non-proliferation conditions attached to any sale in the hope of winning more trade. In 1980 Argentina agreed to accept a tender from a German-Swiss consortium for the construction of a nuclear power station that was reportedly more expensive than a competing tender from Canada. The decisive factor appears to have been the European consortium's insistence on far less comprehensive safeguards.

Nuclear exporters argue in their defence that any nation anxious to develop nuclear weapons could do so regardless of whether or not it was pursuing a civil nuclear programme. Technically, of course, this is true: but it ignores the political realities. A dedicated nuclear weapons programme would require the construction and operation of the necessary facilities in complete secrecy in order to avoid the inevitable international uproar that disclosure would provoke. The great advantage of covertly using a civil programme is that most of the necessary technology and materials can be acquired without attracting any suspicion or opposition. Indeed some observers judge that many near-nuclear countries deliberately exploit their ambiguous positions to reap diplomatic rewards. They formally maintain that they have no intention of developing nuclear weapons, while at the same time let it be clearly understood that they could, if they wished, do so.

It is in this difficult context that the IAEA tries to administer its safeguards – and the result leaves much to be desired. It is not even clear what the IAEA would do if it discovered that the diversion of civil materials to military purposes had actually taken place, other than to announce its suspicions. On only one occasion, in 1981, has it publicly expressed doubts – in relation to power reactors in India and Pakistan. Confidence in IAEA safeguards was dealt a shattering blow by the Israeli government in 1981 when it bombed the Tammuz research reactor in Iraq, claiming that IAEA assurances that it was not being used to make nuclear weapons were wrong. Just 11 days after the bombing, Dr Roger Richter, an IAEA inspector responsible for the Middle East resigned, alleging that the safeguards were 'not adequate' to detect violations by Iraq.[3] Another former IAEA inspector, Emanual Morgan, has concluded that the inspection system is so riddled with deficiencies that its inspectors are 'doomed from the start'.[4]

The IAEA's arm in Europe, EURATOM, has been shown to be seriously inadequate. In 1968 it totally failed to prevent the illicit diversion on the high seas of 200 tonnes of uranium oxide, even though it had to grant an export licence for the shipment. When it discovered that the uranium had been stolen, most probably for Israel's nuclear weapons programme, EURATOM covered up the affair until 1977.[5]

The Non-Proliferation Treaty (NPT) itself is also full of holes. All of the worryingly near-nuclear nations have consistently refused to sign it, arguing that it discriminates unfairly against them – even though they could legally withdraw from it simply by giving 90 days notice. Although some of these non-signatories do allow IAEA safeguards on all their known nuclear facilities, there are key unsafeguarded plants in operation in Argentina, Pakistan, India, Israel and South Africa – perhaps the five countries with the most alarming nuclear ambitions. The loopholes in the safeguards regime, in other words, are so large that it cannot be relied upon to prevent nuclear weapons proliferation. So when the Acheson-Lilienthal report concluded in 1946 that any attempt to prevent proliferation by international agreement 'holds no promise of adequate security', it was right.[6]

## Sizewell and Westinghouse

Although times have been hard for nuclear exporters in recent years, one major American reactor construction company is optimistic about the future. Westinghouse is pinning its hopes on the Central Electricity Generating Board's application to build an American-style pressurised water reactor at Sizewell on the Suffolk coast. The result of the two and a quarter year public inquiry into the £1.2 billion project will be crucial for the company, which has not won an export order since 1978. The go-ahead for Sizewell would be like throwing a lifeline to Westinghouse, enabling it to establish a vital foothold in Britain. The company could then use Sizewell B as a kind of shop-window for reactor sales worldwide, with all the attendant risks of nuclear weapons proliferation.

In 1983 the British television programme *World in Action* alleged that Westinghouse had proposed an arrangement which would enable it to circumvent the 1978 American Nuclear Non-Proliferation Act which was designed to control dubious nuclear exports.[7] The plan was to empower a British licensee to negotiate on its behalf for exports that would be forbidden under American law. The essential pre-requisite for such a scheme was that Sizewell B should get the go-ahead and should be built by Westinghouse. The nuclear industry argued in its defence that American law would apply to any British licensee and pointed to British contract clauses meant to prevent weapons proliferation.

In one respect at least the fears of objectors to Sizewell like Friends of the Earth have already been borne out. Just a month after the inquiry ended, it was revealed in April 1985 that Westinghouse and the British reactor construction consortium, the National Nuclear Corporation, were discussing a new joint British-based enterprise to build Sizewell B and then to go in search of reactor exports.[8] The result of the joint venture, in which Westinghouse starts out with a 85 per cent share, will be to make Britain 'a new international centre of nuclear operations'. The man expected to head the enterprise, Westinghouse executive Bruce Tait, talks enthusiastically about how the nuclear export market now shows 'more activity than we have seen for ten years' and is optimistic that he can win new reactor orders. It has also emerged that the CEGB, as well as awarding Westinghouse the £100 million contract for the design and supply of the reactor's primary circuit, has also asked the company to take on the entire £200 million nuclear steam supply system.[9] All this, they say, is conditional on Government approval for Sizewell B.

# 'Vertical' Proliferation

The superpowers' nuclear arms race–'vertical'proliferation – has created conditions of instability and tension which could lead to nuclear war. The stockpiling of weapons of mass destruction by America, Russia, Britain, France and China, threatens world peace and security. Anyone with any sense believes in the need for nuclear disarmament in all these countries and supports policies that might help that process. Conversely, practices which fuel the nuclear arms race by providing essential materials for weapons should be opposed.

The precise extent to which plutonium produced by Britain's nuclear power stations has and will be used for nuclear weapons in both Britain and America was the subject of intensive probing by the Campaign for Nuclear Disarmament at the Sizewell B Public Inquiry in 1983 and 1984. The issue had never been so closely examined before, so no-one knew exactly what to expect. In the event the facts that emerged tended to confirm some of CND's worst suspicions.[1] CND was lucky to have as its leading researcher and witness, Dr Ross Hesketh, who had recently been forced to retire as a senior research physicist at the CEGB's Berkeley Laboratories in Gloucestershire. In June 1983 he had been sacked by the CEGB for publicly expressing concern about the military use of civil plutonium, only to be reinstated in October a few days before his case was due to come before an industrial tribunal, and after a public campaign on his behalf.

## Official Secrecy

Official secrecy is the first problem encountered when trying to find out how Britain's plutonium has been used. Persistent requests for information about plutonium to the CEGB and British Nuclear Fuels Limited are turned down 'for national security reasons'. Parliamentary questions to ministers are answered evasively or not answered at all because it has been 'the normal practice of successive governments' not to do so. An increasing number of plutonium questions from MPs cannot even be asked as they are rejected by the Table Office at the House of Commons on the (often spurious) grounds that they have been covered by previous answers or are not the responsibility of the government. In March 1985 the Plaid Cymru MP Dafydd Elis Thomas wrote to the Energy Secretary Peter Walker, complaining about the difficulty in getting clear answers to questions about plutonium and asking for the Minister's view on a number of detailed points.[2] Predictably Walker's response avoided directly answering any of Thomas's questions.[3]

Frustrated by similar obfuscation, CND had earlier made a lengthy procedural submission to the Sizewell Inquiry asking the Inspector, Sir Frank Layfield, to order the release of vital data on plutonium.[4] He refused the bulk of CND's request, merely asking the CEGB to provide some statistics on plutonium production since 1977.[5] His decision rested on legal precedent which suggested that the government had an unfettered right to define what should and should not be officially secret. This, said CND, was as 'preposterous, unjust and outmoded as the divine right of kings'.[6] In the event the CEGB refused to provide plutonium production figures for individual reactors, releasing instead figures on the dispatches of plutonium from power station sites.

One piece of information which the British government keeps insisting is secret – the isotopic composition of plutonium sent to America between 1964 and 1971 – has in fact been revealed to the US Congress in a letter from the American Energy Secretary Donald Hodel (the plutonium was said to contain between 7 and 19 per cent of the plutonium 240 isotope).[7] This was after 'extensive consultations with the United Kingdom' – thus exposing the British government's position as glaringly inconsistent. On this side of the Atlantic it has said that the isotopic composition of the exported plutonium is an official secret: on the other side of the Atlantic it has allowed the information to be released. This can only reinforce suspicions that there is no justification for the extent of secrecy about plutonium. The blanket of national security is being deliberately used to conceal the unsavoury truth about the military uses of civil plutonium.

## Unreliability of Official Information

The second major barrier to understanding how plutonium has been used is the fact that official information on the topic is unreliable and subject to governmental or industrial expediency. Even the proper meaning of terms like 'civil' and 'military' plutonium are unclear. BNFL has admitted that there has been 'some confusion and some lack of consistency' over the various definitions used by different official bodies.[8] The CEGB has admitted making mistakes in some of the little information it has provided and confessed to wiping important information about plutonium off its computer tapes.[9]

Information extracted at the Sizewell Inquiry shows how Parliament has been seriously misled by either BNFL or the Government over plutonium exports in at least five ways:[10]

- ☐ Parliament was told that 780 kilogrammes of plutonium exported from Britain came from BNFL's reactors. BNFL has now told the Inquiry that the correct figure was 663 kilogrammes. The missing 117 kilogrammes represents an error of about 18 per cent and is enough for perhaps 25 atomic bombs.
- ☐ Parliament was told on at least three occasions that 50 kilogrammes of plutonium exported to America was civil material.

BNFL now says that the correct figure was 54 kilogrammes and that nearly 90 per cent of it (47 kilogrammes) had come from its military reactors at Calder Hall and Chapelcross.

- ☐ Parliament was told that 1280 kilogrammes of plutonium had been exported after 1971. BNFL says that 53 kilogrammes included in this total had in fact been exported just prior to 1971.
- ☐ Parliament was repeatedly told that all the 1280 kilogrammes of exported plutonium was civil plutonium produced in electricity board reactors. BNFL says that fully half this amount had in fact been produced by its military reactors. The Department of Energy has admitted that Parliament was misinformed by a 'slip of the tongue'.[11]
- ☐ Parliament was twice told that 500 kilogrammes of plutonium from electricity board reactors had been exported since 1971. Information from BNFL implied that the true figure was 392 kilogrammes – a 20 per cent error of 108 kilogrammes, enough for at least 20 nuclear weapons.

Such misrepresentations are evidently important, though, post-Ponting, perhaps hardly surprising. BNFL has denied saying anything misleading and taken care to disown responsibility for the information given to Parliament.[12]

The official version of the plutonium story has been trotted out on many occasions. Take, for example, CEGB board member John Baker:

> *The current position is accordingly quite clear: no plutonium produced in CEGB reactors has been applied to weapons use either in the UK or elsewhere, and it is the policy of the government and of the CEGB that this situation should continue. The CEGB has no reason to believe that these policies will change in the future.*[13]

This statement is untrue for three main reasons.

The first is the manifold contradiction between what has been said to the British Parliament and to the US Congress over the future use of plutonium from CEGB reactors exported to America between 1964 and 1971 under the 1958 Mutual Defence Agreement. Baker's statement, relying explicitly on what Parliament had been told, implies that this plutonium would never be used in weapons. But the US Energy Secretary, Donald Hodel, has made it clear to Congress that the Reagan Administration believes that it is 'completely entitled' to use the CEGB-produced plutonium in American weapons. Indeed, as Hodel himself stressed, the agreement under which it was exported to the US specifically requires its use for military purposes.[14] This means, in effect, that the entire CEGB nuclear system was run for half a decade between 1964 and 1971 as a series of bomb factories for America.

The second reason is the sensational testimony of the highly respected former CEGB chairman, Lord Hinton. In an interview taperecorded a few months before his death in 1983, he described the CEGB's claim that none of its plutonium had been applied to weapons use as 'bloody lies'. He said:

> *I am absolutely certain that (the CEGB) statement is incorrect... I don't know whether they should get permission for a PWR at Sizewell or not, but what is important is that they shouldn't tell bloody lies in their evidence.*[15]

Hinton was known as the father of nuclear energy. His death prompted flattering obituaries in *The Times* and in all the nuclear industry press, with many articles stressing his honesty and forthrightness. The CEGB itself quoted approvingly from one tribute which described him as 'uncompromising in his standards, unswerving in his integrity'. He was chairman of the UK Atomic Energy Authority from 1954 to 1957 and chairman of the CEGB from 1957 to 1964, a period that covered the signing and implementation of the Mutual Defence Agreement and its amendment under which the plutonium swops took place. The CEGB has attempted to discredit his evidence by trying to cast doubt on its genesis. But in the end it has been reduced to claiming that Lord Hinton was 'not in possession of all the relevant facts' and that 'in some respects his knowledge of the facts appears to be inaccurate'.[16]

The third major cause to doubt the official plutonium story is some calculations done by three physicists from Scientists Against Nuclear Arms (SANA), Drs Barnham, Hart and Stevens.[17] Their work represents the best published estimates of Britain's plutonium stocks. It indicates that there are between 6 and 7 tonnes of plutonium unaccounted for in the official figures. (This is quite apart from the hundreds of kilogrammes of plutonium which the industry itself admits regularly gets 'lost' during processing – a phenomenon it describes as MUF Material Unaccounted for.) Information from the US suggests that there are more than 4 tonnes of UK-origin plutonium in American civil research facilities (but earmarked for weapons use in the future). This leaves some 2 tonnes apparently missing, some of which could be weapons-grade material from the Wylfa nuclear power station on Anglesey in Wales.

Dr Hesketh has argued that this plutonium has already gone into weapons either in Britain or America. He has named six of the electricity boards' nine Magnox stations as possible sources of military plutonium (Hinkley Point A, Hunterston A, Berkeley, Bradwell, Wylfa and Sizewell A).[18] Drawing on the work of SANA, he has pointed out that Hinkley Point A, the reactor which was originally modified for military purposes, discharged more than two and a half times its average annual amount of plutonium in 1968-69, a sign that it might have been producing the material for weapons. Perhaps predictably, this has been denied by the CEGB.

The CEGB has spent a lot of time sniping at the SANA calculations but has been unable to disprove them. It has not come up with any alternative figures, claiming that it is prevented from so doing by national security considerations. Indeed the limited information on dispatches of plutonium from power station sites since 1977 which the Board did grudgingly provide tended to confirm that, if anything, SANA's figures slightly underestimated the total amount of plutonium produced.

## Inadequacies of Safeguards in Britain

The safeguards applied in this country by the International Atomic Energy Agency and EURATOM are often referred to as though they gave some kind of meaningful assurance that no civil nuclear material has been or will be used for military purposes. Mr Baker for example has said:

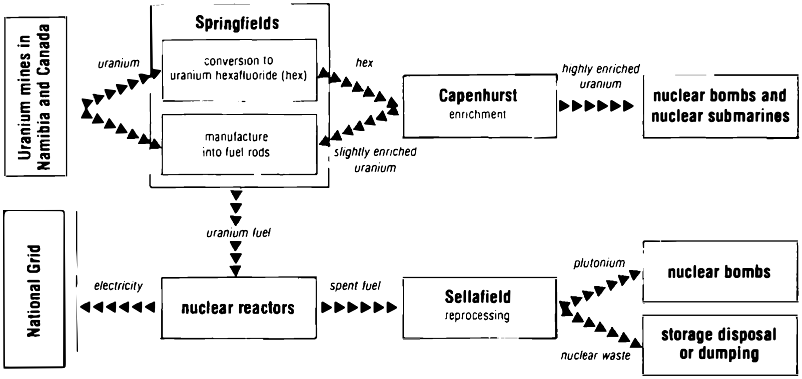
> *The UK has voluntarily entered into safeguards arrangements which underline the government's and CEGB's intention that plutonium produced in CEGB reactors will not be diverted for weapons purposes. The UK supports the aims of and is a signatory to the Non-Proliferation Treaty and as a result of this and our membership of the European Community, UK nuclear power stations and their operating records are subject to inspection by both the IAEA and EURATOM to verify that there is no diversion of plutonium to weapons use.*[19]

The previous section has already shown that plutonium has been used for weapons purposes. In addition, this statement is seriously misleading in at least five important respects.

Firstly, it ignores the fact that the CEGB-produced plutonium which was exported to America under the Mutual Defence Agreement has never had safeguards of any kind applied to it.[20] Secondly, it ignores the real purpose of the IAEA and EURATOM safeguards as applied to the UK, which is explicitly *not* to provide any assurance that British civil material is not being used for military purposes. The main purpose of both safeguards regimes was and is to demonstrate to non-nuclear weapons states that there are no commercial disadvantages inherent in the application of safeguards.[21] Thirdly, it ignores the large loopholes in the relevant treaties which specifically enable Britain to use civil material for weapons or other military purposes should it so wish (*Article* 84 of the EURATOM Treaty and *Article* 14 of the Tripartite UK-IAEA-EURATOM Treaty).

Fourthly, it ignores the gaping hole in the middle of safeguards arrangements that was exposed by CND's cross examination of BNFL witnesses at the Sizewell Inquiry.[22] The British Government has never allowed international inspectors to visit and check the Magnox reprocessing line at Sellafield because it processes both civil and military spent fuel. Directly as a result of this damning admission, a motion has been put to the European Parliament calling on the Common Market Energy Commissioner to force the Brit-

**THE NUCLEAR FUEL AND WEAPONS CYCLE IN BRITAIN**




**Our electricity comes from the same processes that produce plutonium and highly enriched uranium for our nuclear warheads.**

ish Government to allow EURATOM inspectors access to the Sellafield reprocessing line.

CND has also exposed how the practice of 'co-processing' at Sellafield means that civil and military material could have been swopped in various ways during reprocessing in a way that would be completely unnoticed by the safeguards authorities.[23] Surprisingly, BNFL went out of its way to confirm that these allegations were 'perfectly right in principle'.[24] The Energy Secretary Peter Walker MP has also admitted that 'co-processing inevitably means that the atoms generated in safeguarded and unsafeguarded stations cannot be separately identified at the end of the process'.[25] The practice of co-processing, in other words, utterly destroys any pretence that there is a separation of the civil and the military uses of nuclear energy in Britain. It also makes a mockery of any attempt to render the nuclear industry and the Government accountable for how their plutonium has been or will be used.

Fifthly, Mr Baker's statement ignores the extremely limited extent to which IAEA safeguards are applied in this country. The IAEA has not designated for inspection a single electricity board power station, nor does it inspect a single gramme of British plutonium in Britain. Britain's much-trumpeted offer voluntarily to submit its facilities to IAEA safeguards was and is a complete farce, a meaningless public relations gesture. The only guarantee that no civil plutonium has been or will be used for military purposes is a series of bland unsubstantiated governmental assurances to that effect. Precisely the same would apply if every vestige of safeguards were scrapped tomorrow.

It is not surprising that the British public is becoming increasingly sceptical of the validity of the supposed distinction between nuclear power and nuclear weapons. It is not surprising that the nations in the world without nuclear weapons are getting angry and restless. It is not surprising that international attempts to curb the spread of nuclear weapons are failing and that the Nuclear Non-Proliferation Treaty – up for review in 1985 – is on the brink of collapsing. Britain is effectively telling other countries to do as it says but not as it does. We are setting the world an appalling and disgraceful example.

The blurring of the distinction between the civil and military uses of nuclear energy in Britain is profoundly dangerous. It gives the military establishments on both sides of the Atlantic a huge pool of potential nuclear explosives on which to draw to expand their already massive nuclear arsenals. It sends precisely the wrong signal to near-nuclear weapons states like Argentina, Brazil, South Africa, Israel, Pakistan, Libya, Iran and Iraq. Instead of encouraging them to use their civil nuclear facilities for purely civil purposes, it encourages them to copy us and use their atoms for war as well as peace.

# Towards a Nuclear-Free Future

Nuclear power and nuclear weapons are like Siamese twins, conceived together, joined at birth and now inseparable. The facilities at the heart of Britain's nuclear power programme run by British Nuclear Fuels Limited – Sellafield, Capenhurst, Calder Hall and Chapelcross – are also at the heart of the country's nuclear weapons programme. **Sellafield** processes all the plutonium for Britain's nuclear weapons; **Capenhurst** enriches uranium for military purposes; **Calder Hall** produces electricity for consumers and plutonium for weapons; and **Chapelcross** produces both plutonium and tritium for weapons at the same time as generating electricity for the grid. The plutonium from Calder Hall and Chapelcross is used in both British and American nuclear warheads.

In spite of international safeguards, the export of 'civil' nuclear technologies in practice leads to the spread of nuclear weapons. A decision to go ahead with Sizewell B in Britain would boost Westinghouse's export prospects, thereby increasing the risk of nuclear weapons proliferation. In spite of the problems of official secrecy and unreliable information, it seems likely that plutonium from electricity board reactors could have been used in nuclear weapons in the past. Some electricity board plutonium is destined for use in American nuclear warheads in the future. The safeguards regime in Britain was and is powerless to prevent this from happening.

The plutonium inevitably produced by any existing or future nuclear power station could find its way into weapons. There are at least two main routes by which the type of 'reactor-grade' plutonium produced during normal operation could easily be made into weapons-grade plutonium. The first route involves a radically different type of reactor known as the fast breeder which uses reactor-grade plutonium in its core to make pure weapons-grade plutonium in the 'blanket' that surrounds the core. The Phenix prototype fast reactor in France has already been operated in this way to produce plutonium for French nuclear weapons. The same is planned for its successor, the commercial-scale Superphenix fast reactor, due to come on stream in 1985.[1] The second route involves using a new technology called Laser Isotope Separation, which is currently under development in Britain and America, to turn reactor-grade into weapons-grade plutonium. This is already being planned by the Department of Energy in America.[2] Whilst the technical possibility of both routes has been confirmed by BNFL and the CEGB, they play down the extent to which they could undermine efforts to control the spread of nuclear weapons.[3]

In short the idea of 'Atoms for Peace' simply does not work. Atomic bombs can be made from between two and ten kilogrammes of plutonium 239.[4] In 1984 there were nearly 20 tonnes of plutonium from electricity board Magnox reactors in storage at Sellafield.[5] Assuming an average of about five kilogrammes per bomb, that is enough for around 4,000 bombs. On present plans electricity board Magnox stations will produce about another 30 tonnes before they are shut down. The current programme of advanced gas-cooled reactors is likely to produce a further 34 tonnes, with a large-scale future pressurised water reactor programme amassing another 95 tonnes.[6] That gives an overall total of almost 180 tonnes – enough for about 36,000 bombs. Although no-one pretends that plutonium isn't produced in these reactors, as things stand neither the Government nor the nuclear industry in Britain can be properly called to account about how it will be used.

The connection between nuclear power and nuclear weapons has profoundly dangerous implications. It means that civil nuclear trade can spread nuclear weapons and that civil nuclear power stations can be turned into bombs factories. It means that wherever there are 'civil' nuclear facilities and materials, there could easily be nuclear bombs. It means that efforts to tackle horizontal and vertical prolifer-

## Types of nuclear reactor

Most nuclear reactors utilise a chain reaction in uranium fuel which is controlled and sustained by slowing down the neutrons emitted in the reaction. Neutrons are slowed by moderators to so-called thermal speeds at which they are more likely to fission other uranium nuclei.

The uranium in the reactor is gradually transformed by the reaction into a number of different elements, including plutonium. The heat generated is used to raise steam to turn turbines to produce electricity in a similar way to coal-fired power stations.

**Magnox reactors** use natural uranium as the fuel, graphite as the moderator, and carbon dioxide gas as the coolant to extract the heat. Refuelling can be done on load, and when optimised for electricity production the Magnox reactor produces plutonium containing about 75 per cent of the plutonium 239 isotope.

**Advanced gas-cooled reactors** (AGRs) are a later development of the Magnox reactor. They use two per cent enriched uranium oxide as the fuel, graphite as the moderator and carbon dioxide gas as the coolant to extract the heat.

**Pressurised water reactors** (PWRs), the type planned for Sizewell in Suffolk, use three per cent enriched uranium oxide as the fuel, water as the moderator and water under pressure as the coolant to extract the heat. Refuelling cannot be done on load, and in usual operation the PWR produces plutonium containing 57 per cent of the plutonium 239 isotope. Small versions of the PWR have been used to power the British navy's nuclear submarines for the last twenty years.

**Fast reactors**, which are still at the development stage, are a radically different type of reactor. They are fuelled by plutonium, or a mixture of plutonium and uranium, and use liquid sodium as the coolant to extract the heat. The neutrons are not slowed by any moderator and at so-called fast speeds breed further plutonium in the blanket of uranium which surrounds the reactor core. The plutonium bred by fast reactors contains a very high proportion of the plutonium 239 isotope and is generally regarded as weapons grade.

ation must go hand in hand, on the assumption that controlling one will help control the other. If nations with nuclear weapons can begin to reverse the nuclear arms race, perhaps nations without nuclear weapons will be less anxious to acquire them.

This is the bargain at the heart of the Nuclear Non-Proliferation Treaty, as embodied in its *Article* VI committing all parties to:

> *Pursue negotiations in good faith on effective measures relating to the cessation of the nuclear arms race at an early date, and to nuclear disarmament, and on a treaty of general and complete disarmament under strict and effective control.*

Nuclear weapons states have patently not kept their side of the bargain, allowing the nuclear arms race to escalate alarmingly out of control over the last decade. Even the head of Britain's Foreign Office delegation to the IAEA, Mr M J Wilshurst, has been moved to remark on the 'hypocrisy' of countries like Britain,

> *seeking to prevent others from acquiring what they themselves have acquired, even though those others may have the same reasons for wishing to acquire them.*[7]

The NPT is inadequate and deeply self-contradictory. It is a treaty in need of immediate and radical reform, not least to remove its encouragement of 'civil' nuclear exports. But for all its flaws, it is important that it is strengthened and survives. However misconceived, fragile and threatened it might be, we cannot do without it. It is one of the world's only barriers to nuclear mayhem.

An important and realisable step forward would be for the nuclear weapons states to agree a comprehensive ban on the testing of nuclear weapons as soon as possible. Progress in this direction has been made in the past and there is little to prevent the nuclear weapons states from making such an agreement, supported as it is by a broad range of political opinion in the West. A comprehensive test ban could hinder the development of first-strike weapons systems and the 'Star Wars' strategic defence initiative. With luck it might lead to some gradual movement towards genuine nuclear disarmament.

In the longer term however, much more radical steps will have to be taken. Nuclear power provides a mere three per cent of all the energy delivered to consumers: it is by no means essential to meet our energy requirements. By concentrating on energy conservation, by using cleaner and more efficient ways of burning coal and, in the longer term, by developing renewable energy alternatives based on the sun, wind and waves, Britain could phase out its dependence on nuclear electricity. Such a course of action should form the basis of our eventual aim: total nuclear disarmament. The proliferation problem only begins with the creation of plutonium in nuclear reactors: it will only finally be solved when all the reactors have been shut down. ■

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4. CND Sizewell Inquiry documents CND/S/57, CND/S/57(ADD 1) and transcript for Day 193 of the Sizewell B Public Inquiry.

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# Recommended Reading

Those interested in following up the proliferation issues raised at the Sizewell B Inquiry should consult the following Inquiry documents.

The Campaign for Nuclear Disarmament's documents:

CND/P/1, CND/P/1 (ADD 1), CND/P/1 (ADD 2) (Dr Ross Hesketh's proofs);
CND/P/2 (David Lowry's proof);
CND/P/3, CND/P/3 (ADD 1), CND/P/3 (ADD 2) (Rob Edward's proofs);
CND/S/57, CND/S/57 (ADD 1) (Procedural submissions on secrecy);
CND/S/150A, CND/S/150B (appendices to Dr Ross Hesketh's proof);
CND/S/151, CND/S/167, CND/S/167 (ADD 1), CND/S/167 (ADD 2),
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Other objectors' proofs about proliferation:

FOE/P/5 (Walter C. Patterson's proof for Friends of the Earth);
NUM/P/2 (Tony Benn MP's proof for the National Union of Mineworkers);
TCPA/P/5 (Martin Ince's proof for the Town and Country Planning Assoc.).

The Central Electricity Generating Board's documents:

CEGB/P/1 (Mr John Baker's proof);
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British Nuclear Fuels Limited's documents:

BNFL/P/1 (ADD 10), BNFL/P/1 (ADD 11) (information on plutonium exports).

Department of Energy's documents:

DEN/P/1 (ADD 3) (plutonium information);
DEN/S/11 (parliamentary answers on plutonium and safeguards).

Transcripts for the following days:

42 (CND's cross examination of Department of Energy);
47 (Council to the Inquiry's cross examination of Department of Energy);
67 (CND's cross examination of the CEGB);
131 (cross examination of Martin Ince on proliferation);
150 (cross examination of Tony Benn MP);
182 (cross examination of Walter C. Patterson on proliferation);
193 (CND's procedural submission on secrecy);
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Walter C. Patterson, *The Plutonium Business and the Spread of the Bomb*, Wildwood House, London, 1984.

Walter C. Patterson, *Nuclear Power*, Penguin, London, 1983.

Patrick O'Heffernan, Amory B. Lovins and L. Hunter Lovins, *The First Nuclear World War*, Hutchinson, London, 1984.

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# Parliamentary Answers & Questions

**For readers who would like to both see what Parliamentary initiatives have already been taken on the issues discussed and to pursue additional initiatives through their own or other sympathetic MPs, we include the following selective list of relevant Parliamentary answers and statements.** (Contact Marjorie Thompson, CND's Parliamentary Liaison Officer for further information.)

## PLUTONIUM SAFEGUARDS AND ACCOUNTANCY

| | DATE | COLUMN REFERENCE IN HANSARD |
|---|---|---|
| **1984** | | |
| NOV | 19 | Cols 23/24, 25 |
| | 21 | Cols 159, 160 |
| DEC | 3 | Col 23, 24, 25 |
| | 13 | Col 550/551 |
| | 17 | Col 26, 28/29 |
| | 18 | Col 82/83 |
| | 21 | Col 348, 349 |
| **1985** | | |
| JAN | 15 | Col 85 |
| | 17 | Col 183 |
| | 23 | Col 23 |
| | 25 | Cols 545/546/547 |
| FEB | 7 | Col 629 |
| | 15 | Col 299 |
| | 18 | Col 353, 355/356, 359 |
| | 19 | Col 406/407, 431 |
| MARCH | 1 | Col 324/325 |
| | 4 | Col 359, 396 |
| | 11 | Col 53/54 |
| | 20 | Col 517 |
| | 22 | Col 633 |
| | 25 | Col 104 |
| APRIL | 1 | Cols 465/466, 467 |
| | 2 | Col 589 |
| | 3 | Col 634 |
| | 4 | Col 693/694 |
| | 15 | Col 31 |
| MAY | 13 | Col 17 |
| | 16 | Col 181, 210 |
| | 20 | Col 285, 369 |
| JUNE | 10 | Col 299 |
| | 14 | Col 581 |
| | 24 | Cols 290/291 |

| | | |
|---|---|---|
| JULY | 4 | Cols 198/199 |
| | 5 | Col 307, 308 |
| | 12 | Col 556 |
| | 17 | Col 180 |
| | 18 | Col 247 |
| | 23 | Col 473 |
| | 26 | Cols 805/806 |

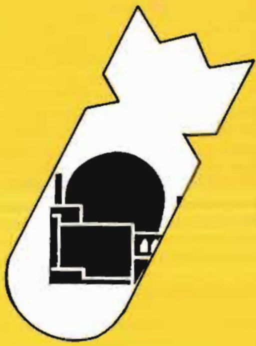
**These answers confirm the Government intention not to 'come clean' about the uses to which 'civil' plutonium has been put. Their excuses for failing to give full details range from 'treaty obligations' to 'it has been the practise of successive governments not to release details' to 'national security restrictions' to 'commercial sensitivity'.**

**Since January 90 Parliamentary questions have been raised regarding the nuclear Non-Proliferation Treaty, compared to 9 in the same period before the NPT Review Conference in August 1980.**

## PROLIFERATION AND NPT

| 1985 | DATE | COLUMN REF. IN HANSARD |
|---|---|---|
| JANUARY | 18 | Col 236 |
| | 21 | Cols 309, 313/314 |
| | 28 | Cols 24/25, 38 |
| FEBRUARY | 20 | Col 478 |
| | 22 | Cols 606/607 |
| MARCH | 1 | Cols 303/304 |
| | 5 | Cols 437/438 |
| | 19 | Col 438 |
| APRIL | 3 | Cols 631-633 |
| | 4 | Col 731 |
| | 16 | Col 123 |
| | 25 | Cols 1073/1074 |
| MAY | 3 | Col 258 |
| | 7 | Cols 318/319 |
| | 13 | Col 17 |
| | 17 | Cols 267/268 |
| | 20 | Cols 284, 334, 336 |
| | 22 | Cols 454, 458, 465 |
| JUNE | 6 | Cols 542-548 |
| | 10 | Cols 312/313 |
| | 11 | Col 416 |
| | 13 | Col 536 |
| | 26 | Cols 416/417 |
| | 27 | Col 475 |
| JULY | 2 | Cols 107/108 |
| | 4 | Col 264 |
| | 9 | Col 898 |
| | 15 | Col 48 |
| | 19 | Cols 292/293 |
| | 23 | Col 474 |
| | 24 | Cols 584, 59/592/593 |
| | 25 | Cols 631/632, 680/681, 683, 698 |
| | 26 | Col 905, 906 |
| **In the Lords** | | |
| JULY | 29 | Col 151 |
| | 31 | Cols 332/333/334 |

**The overwhelming response by government ministers has been one of complacency and a 'blind faith' that the United Kingdom has abided by its Non-Proliferation Treaty obligations.**



# NUCLEAR POWER
# NUCLEAR WEAPONS

## THE DEADLY CONNECTION

Rob Edwards

**We are continually assured that nuclear power has nothing to do with nuclear weapons, that there is such a thing as 'atoms for peace', and any doubts result from a 'confusion'. This pamphlet reveals that such confusion is well-grounded, as it is a result of a powerful deception waged by successive governments.**

The Deadly Connection **exposes the fact that nuclear power and nuclear weapons are like Siamese twins, conceived together, joined at birth and now inseparable. The facilities central to the production of Britain's nuclear power, Sellafield, Capenhurst, Calderhall and Chapelcross, are also at the heart of the country's nuclear weapons programme. The author shows how this programme was developed; how the export of nuclear power technologies aids the spread of nuclear weapons; how International Safeguards to control the misuse of civil nuclear power have proved powerless in a climate of secrecy and misinformation; and how nuclear power has fuelled the arms race itself. All these developments violate the Nuclear Non-Proliferation Treaty, which the author argues, must be strengthened and reformed if we are to avoid nuclear mayhem. This should be a first step towards a nuclear-free future.**

**In the meantime, this pamphlet challenges the secrecy and mendacity surrounding an issue of supreme importance to us all.**

The Nuclear Debate/
Current Affairs

**95p**

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