
Sizewell B power station

Environmental Statement 2002



British Energy
Sizewell B Power Station
*This site has an environmental management system
and its environmental performance is reported on to
the public in accordance with the Community
eco-management and audit scheme.*
(Registration No. UK-S-0000038)



The beach at Sizewell



Common spotted orchid



Nature trail in the Kenton Hills woodland

FOREWORD

As the Station Director of Sizewell B nuclear power station, I welcome the increasing emphasis on environmental responsibility in industry.

At Sizewell B we produce sufficient electricity for 1.5 million people. We do this in a way that we believe is actually more sustainable and less environmentally harmful than any other large scale energy industry. We take responsibility for our environmental impact, and we systematically reduce harmful environmental effects to a practicable minimum.

We believe that the requirements for successful environmental management are also requirements for a successful business. We remain committed to systematic environmental management using ISO 14001 and open reporting of our performance using the European Eco-Management and Audit Scheme, EMAS.

This Environmental Statement sets out our policy, gives details of our significant environmental effects and how we are managing them, and reports on our performance against set environmental enhancement objectives.

Norman Harrison,
Station Director, Sizewell B.



LOCATION & PROCESS

Location

Sizewell B is one of 8 nuclear power stations in the UK owned and operated by British Energy Plc, a company with international involvement in electricity generation and supply. Sizewell B is situated in a pleasant rural area on the coast, 3 km east of the small town of Leiston in Suffolk. The power station operational site covers 16.5 hectares (40 acres). A further 720 hectares (1770 acres), including marshes, heaths and woodland as well as grazing and arable farmland are owned by British Energy, a large proportion of which is designated as a SSSI. Sizewell A, a nuclear power station operated by BNFL Plc, occupies an adjacent site. Approximately 36,000 people live within 15 km of Sizewell. The small towns of Leiston, Saxmundham, Aldeburgh and Southwold, and many villages in between, are also home to a range of tourist attractions and cultural activities particularly in the summer. The RSPB bird sanctuary at Minsmere, the Aldeburgh Festival at Snape Maltings, and the summer theatres at Southwold and Aldeburgh are notable. Agriculture is the most obvious industry, but there are also small light industrial estates, plus many commercial and local service companies.



Sizewell B Power Station

Process

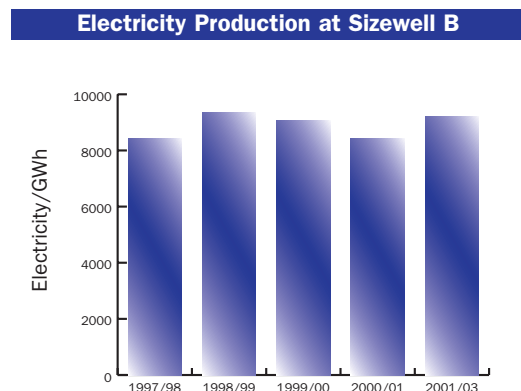
Sizewell B is the only Pressurised Water Reactor (PWR) electricity generating power station in the UK, although they are common in France, Germany, the USA, Japan and many other countries. Whereas at fossil-fuelled power stations heat comes from burning coal, oil or gas, at a nuclear power station the heat comes from splitting uranium atoms in a controlled process called nuclear fission. During the fission process a uranium atom is split, usually into two. This produces huge amounts of energy, which is released in the form of heat. The heat produces steam and the steam drives the turbines, which in turn drive generators. Sizewell B's electricity, transmitted via the National Grid to consumers, is sufficient for the needs of about 1.5 million people.



Turbine Hall

The term "sustainable development" is commonly used to mean activities that can be carried out today without unreasonably restricting future activities. In practice, sustainable activities should not consume seriously limited resources and their wastes should not cause serious harm.

Sizewell B produces negligible gaseous pollution such as carbon dioxide, sulphur oxides, nitrogen oxides and methane, which are implicated in global warming, acid rain, and ozone depletion. Of course, Sizewell B does use certain resources and produce particular wastes. An important resource used is uranium and some wastes are radioactive. Uranium ore is a naturally occurring radioactive material that is mined, and radioactive waste is a by-product of the use of uranium as a fuel, most of which is buried at the end of the process! This is a managed and sustainable environmental cycle, fully consistent with the principles of sustainable development. Given the scale of electricity production, Sizewell B is remarkably environmentally benign.



PEOPLE, ENVIRONMENTAL MANAGEMENT SYSTEM & EMAS

People

409 British Energy staff (including apprentices, agency and fixed term staff) and 260 additional full-time personnel (contractors), operate and maintain the power station, with more personnel on site at times of high work-load, e.g. during planned refuelling outages.

The "Environment" is a community issue, and staff, as responsible members of the community, have been a major driving force in the evolution of Sizewell B's environmental management arrangements. Staff are very much behind the unambiguous ethical tone of the policy and the emphasis on environmental responsibility. Personnel are the main source of ideas to reduce resource use, reduce waste arising and more effective waste management. Staff at Sizewell B believe in the positive environmental credentials of their product and their process. Many have worked at other kinds of power station, in other energy industries and in other organisations and are able to compare safety and environmental standards achieved. There is strong support for maintaining and improving standards, and for benchmarking performance against the best in the world.

Sizewell B personnel, in their professional capacities, are involved in Environment Agency (EA) activities. The EA's principal aim is to protect and enhance the environment and to contribute to attaining sustainable development. Staff at Sizewell have a close working relationship with the EA and actively seek their advice regarding best environmental practices and legislation.

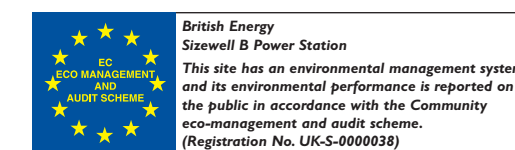
Members of staff have made many contributions to public conferences, debates and journals about environmental responsibility and sustainable development in the energy industry and about the wider context of ethics and values in industry.

The environmental management system

The Nuclear Installations Inspectorate under the Nuclear Installations Act 1965 (as amended 1969) licenses Sizewell B. The station's quality management system has developed from being solely directed towards nuclear safety (based on British Standard BS 5882), to include the management of all activities which affect safety, reliability, the environment and significant cost. ISO 14001 (see Glossary page 22) provides the framework for ensuring and demonstrating a high standard of environmental responsibility. This includes publishing an environmental policy, systematically complying with environmental protection legislation, pursuing objectives which will result in continuous improvement in environmental performance, plus methodically assessing and managing environmental effects.

The station has an enlightened culture in which people at all levels are actively involved in the development of policies, objectives and procedures, and in which everyone openly reports unexpected events. These are then investigated, prioritised actions are agreed and implemented in order that lessons are really learned. There is strong management belief that effective learning reduces risks.

All power stations owned by British Energy invite independent evaluations and audits to help ensure the maintenance of high standards. Through the efforts of many people, Sizewell B achieved BS 7750 certification in 1995, and then became the first nuclear power station in the world to gain certification to ISO 14001 in 1996.



In addition, the Station has established an internal audit programme based on a rolling annual period. General integrated audits are undertaken covering the whole range of business activities. Further audits on specific topics are initiated as a result of concerns raised by staff and management or because of incidents that have occurred either on site or at one of the Company's other stations. Trained staff carry out audits and the findings are incorporated into the overall management process enabling continued improvement of our processes and systems.

European eco-management & audit scheme (EMAS)

EMAS is a voluntary scheme promoted by the European Union. Sizewell B was the first nuclear power station to have EMAS registration. The main aim of EMAS is the improvement of environmental performance of industrial activities. EMAS registration requires the regular publication of independently verified information on environmental performance. This is the fourth Environmental Statement for Sizewell B, and covers the period from April 2000 to March 2002. Data on environmental performance is published annually.

ENVIRONMENTAL POLICY

Environmental Protection is a very important issue, which inter-links with safety. We believe that all the requirements for successful environmental management are also requirements for a successful business. "We" means all of us who work at Sizewell B.

Sizewell B operates within the overall Environmental Policy of British Energy, and as part of our everyday business:

- **We systematically comply with all mandatory requirements for environmental protection;**
 - we do better than statutory requirements when this is reasonably practicable;
- **We aim to reduce harmful environmental effects to a practicable minimum;**
 - we assess environmental effects and risks as an integral part of the planning and implementation of all work activities;
- **We strive for the prevention of pollution;**
 - we take full responsibility for the wastes we produce, disposing of them only when we are confident that the environmental impact is small;
 - we have contingency plans which address environmental risks;
 - we monitor the environmental impact of our operations on the countryside;
- **We strive for continual improvements in environmental performance;**
 - we set Environmental Objectives and manage them through our Business Plan;
 - we learn from the experience of others as well as our own;
- **We make efficient use of natural resources and energy;**
 - we use resources, but we try to use less, waste less, re-use more and recycle more;
- **We increase environmental awareness amongst all our personnel;**
 - we encourage a proactive attitude to environmental responsibility;

- **We publish environmental objectives and an environmental statement;**
 - we communicate with interested parties for wider mutual understanding;
 - we make available further information about our environmental policies, objectives and performance, in publications and on the British Energy Web page.
- **We purchase in an environmentally responsible manner; and**
 - we encourage our suppliers and contractors to reduce their environmental impact.

Sizewell B manages all environmental aspects using the guidance of BS EN ISO 14001, the British, European and International Standard for Environmental Management Systems, and EMAS, the European Eco-Management and Audit Scheme. We are regularly and independently audited against these standards, which specify management requirements and provide recognition of responsible environmental performance. We aim to ensure that the production of electricity at Sizewell B is clean and environmentally safe.



Bog bean flourishing by the Sizewell Visitor Centre - a species rarely found outside the Norfolk Broads

SIGNIFICANT ENVIRONMENTAL EFFECTS

All environmental aspects of Sizewell B are under continuous review. This includes environmental effects, such as:

- uses of physical resources and energy;
- emissions into the atmosphere;
- discharges to the sea and rivers;
- solid and other waste arising;
- contamination of land;
- noise and other impacts (on society); and
- effects on specific ecosystems.

Practical efforts are made to reduce all harmful environmental effects through the general policy of "reduce, re-use, recycle". Reducing resource consumption and reducing waste production saves money. This reinforces the station's desire to manage resources and wastes effectively.

Significant environmental effects are more tightly controlled. An effect is considered significant if it:

- is controlled by regulatory requirements;
- causes serious public concern; and/or
- causes quantifiable effects on species and habitats important for nature conservation.

Awareness of environmental issues is discussed in work groups and encouragement is given to implementing ideas to improve environmental performance, especially in the significant areas and those targeted as Environmental Enhancement Objectives in the Business Plan.

Radioactivity in gaseous emissions, liquid discharges & solid waste disposals

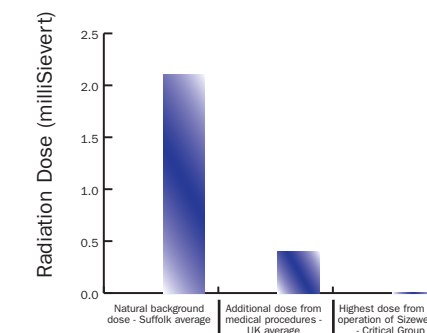
These are subject to the Radioactive Substances Act 1993. Sizewell B is authorised by the Environment Agency (EA):

- for the emission of small amounts of radioactivity into the atmosphere (authorisation AS3820);
- for the discharge of small amounts of radioactivity to the sea (AS3838/AX4109);
- for the incineration of small amounts of radioactive waste (AS3846).

Each authorisation sets specific numerical limits, conditions for discharge, sampling, measurement,

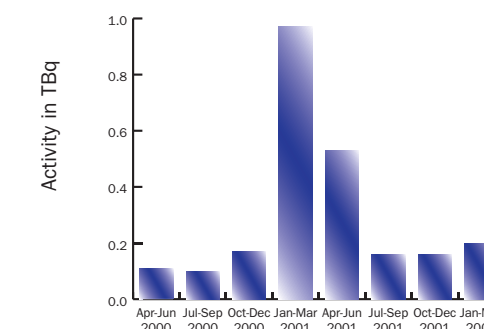
records and reporting of the release of radioactivity. They also require the use of "best practicable means" to reduce radioactivity discharges further, to ensure that radiation doses to the public are as low as reasonably practicable. There has been no discharge of radioactivity in breach of any radiological discharge authorisation. The programme of radiological monitoring of the surrounding countryside continues. The results are routinely reported, published annually and presented to local community representatives at meetings of the Local Community Liaison Council. The highest annual radiation dose to members of the public (see "critical group dose" in glossary) living near Sizewell B from all radioactivity discharged from the station is very small (less than 0.005 mSv). This can be compared with the average radiation dose to members of the public in Suffolk from natural sources of 2.10 mSv per year, and the average from diagnostic medical procedures in the UK of 0.4 mSv per year.

Doses to members of the public



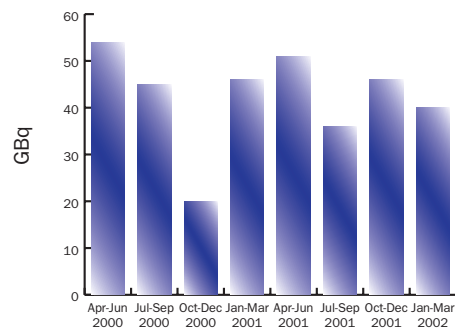
Radioactive emissions into the atmosphere are subject to authorised limits for different categories of radioactivity (tritium, carbon-14, beta emitting radionuclides associated with particulate matter, halogens and noble gases). Operational controls reduce the amount of gaseous radioactivity in the primary circuit. Using high efficiency and carbon filters further reduces emissions. The used filters are a solid radioactive waste.

Tritium in Gaseous Emissions



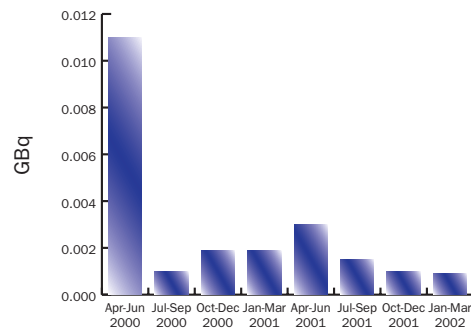
Annual limit 8 TBq
Dose equivalent 0.25 TBq + 0.008 microSv

Carbon-14 in gaseous emissions



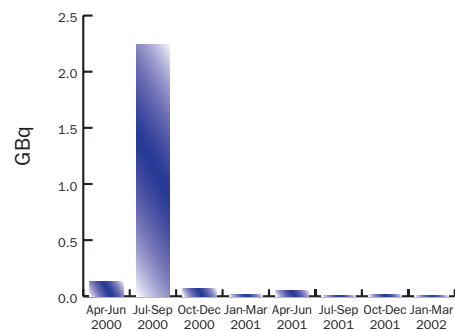
Annual limit 600 GBq

Beta emitting radionuclides associated with particulate matter in gaseous emissions



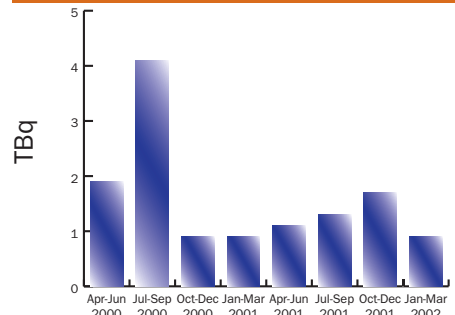
Annual limit 10 GBq
Dose equivalent 0.01 GBq + 0.0005 microSv

Halogens in gaseous emissions



Annual limit 3 GBq
Dose equivalent 0.03 GBq + 0.001 microSv

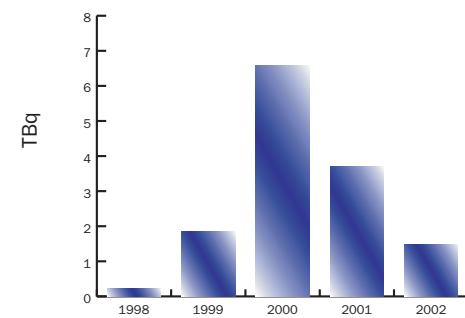
Noble gases in gaseous emissions



Annual limit 300 TBq
Dose equivalent 2.5 TBq = 0.0025 microSv

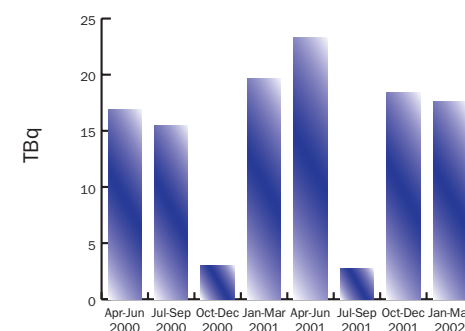
Radioactive emissions from the low-level combustible radioactive waste incinerators are restricted by the authorisation, which limits the amount of radioactivity in the dry wastes, and waste oil that can be burned. Waste containing only 138.2 MBq was burned during the period from April 1998 to March 2002, although the authorisation allows 370 MBq/month to be burned. Burning this waste reduces its volume substantially. The ash produced is a solid low level radioactive waste.

Annual incineration levels



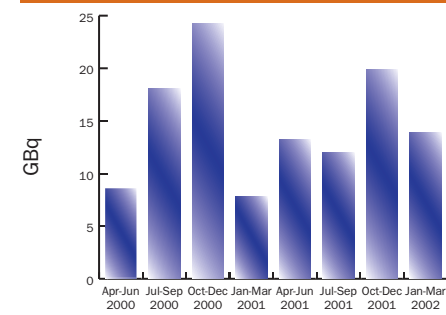
Radioactive discharges to the sea are subject to authorised limits for tritium and other radionuclides. Chemical control of the primary circuit reduces the amount of particulate and dissolved radioactivity, and thus reduces radiation doses rates and corrosion rates. Discharges are further reduced by a combination of filtration and demineralisation. The used filters and resins are a solid radioactive waste.

Tritium in liquid discharges



Annual limit 80 TBq
Dose equivalent 25 TBq = 0.0025 microSv

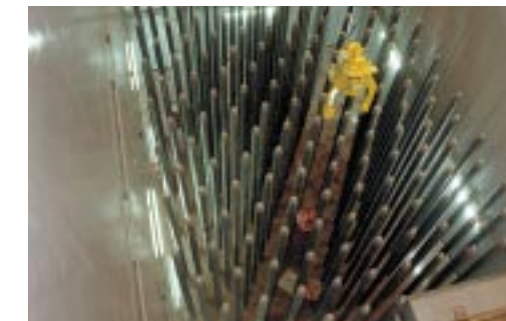
Other radionuclides in liquid discharges



Annual limit 200 GBq
Dose equivalent 8 GBq = 0.15 microSv

Solid low level radioactive wastes are produced, processed and safely stored in an engineered facility on site in preparation for disposal. An application has been made for an authorisation to dispose of these wastes at Drigg in Cumbria. This facility, operated by BNFL, has an environmental management system certificated to ISO 14001. During the 7 years of electricity generation up to April 2002 a total of 200 m3 of Low Level Waste has been produced and is safely stored. Of this, 97 m3 is encapsulated resins, 21 m3 filters (used for reducing the radioactivity in liquid discharges), and 82 m3 mixed trash from the radiologically controlled area. Disposals to Drigg will commence in the Autumn of 2002.

Intermediate level radioactive wastes are produced, processed and safely stored in an engineered facility on site in preparation for disposal. Although there is currently no licensed disposal site in the UK for these wastes, the amounts in store are small and the technology for disposal has been proved in Sweden, Finland, France and the USA. During the 5 years of electricity generation up to March 2000 a total of 29.7 m3 of Intermediate Level Waste has been produced and is in store. Of this, 9.9 m3 is resins and 19.8 m3 filters (used for reducing the radioactivity in the primary water circuit, thus reducing radiation levels that staff are exposed to and reducing the radioactivity in liquid discharges).



Radwaste store

Nuclear fuel purchase, use & waste disposal

Nuclear fuel currently being used was manufactured by BNFL at Springfields in Lancashire and Siemens at Anlagen in Germany. Both factories have certificated environmental management systems. In May 2002, the fifth routine refuelling was carried out. About 182 tonnes of used uranium fuel is now safely stored in cooling ponds, where its condition is monitored. European and International treaties require a high standard of security and that the inventory of nuclear materials is reported. Over a period of years, the rate of heat generation and the radiation emission level diminish substantially. The used nuclear fuel will eventually be processed and packaged for direct disposal in a purpose built repository.



Used fuel storage pond

Combustion plant gaseous emissions & solid waste disposals

These are subject to the Environmental Protection Act 1990. Authorisations, issued by the Environment Agency (EA) are held:

- for gaseous emissions and solid waste disposals from diesel/fuel oil plant (AF8017);
- for solid waste disposals from the radioactive waste incinerators (AI3470/AV6957).

The authorisations set specific numerical limits and conditions for discharge, sampling, measurement, records and reporting of releases from the diesel and fuel oil burning plant, including that installed for back-up electricity supplies, auxiliary steam production, domestic heating and radioactive waste incineration. Further than this they require the use of "best available techniques not entailing excessive cost" to prevent, reduce and render harmless any releases. During the period covered by this report there were no breaches to the Gaseous emissions authorisation.



Water, chemical & thermal discharges

Discharges of effluent from trade premises are subject to the Water Resources Act 1991. Sizewell B is authorised by the EA:

- for water, low concentrations of specified chemicals and thermal discharges to the sea (consent PRECS/3962).

The consent sets specific numerical limits and conditions for discharges. They also require the use of the “best available techniques not entailing excessive cost” to reduce further the chemicals added to the influent water.

Oil storage & handling

The above consent for discharge of liquid effluent to the sea (consent PRECS/3962) also requires, as far as reasonably practicable, the prevention of the discharge of any significant trace of visible oil, and certainly no more than 5 mg/l of hydrocarbon oils. This is a very strict requirement and, although there has been no infringement concerning oil to date, efforts need to be maintained to ensure that this continues. Since the last EMAS statement was published there has been a change in UK legislation regarding Oil Management, The Control of Pollution (Oil Storage)(England) Regulations 2001. As a result the Company has released its own specification to ensure that Sites comply with National legislation. These were implemented in October 2001. Oil deliveries are closely monitored and oil tanks, bunds, pipes and trenches around site are regularly inspected. A set of common sense rules is publicised to promote safety and environmental responsibility in the storage and handling of oil and diesel fuel. These include observing the detailed requirements of the Hazardous Substance Data Sheet, the use of proper containers and drip trays to prevent the spillage and seepage of oil into the ground, the reporting of any leaks and spills, and the proper disposal of waste oil (as a Special Waste).

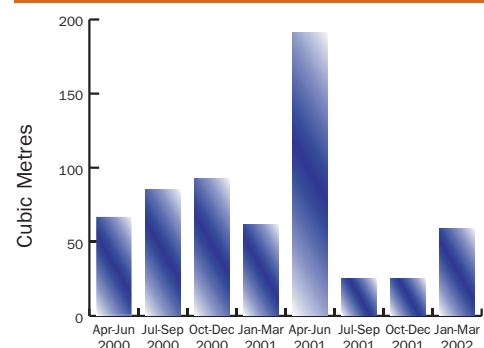
Commercial, industrial, special & clinical waste disposal

Proper consideration of processes producing wastes is an integral part of the planning and implementation of all work. The application of “reduce, re-use, recycle” results in the use of less resources and the production of less waste. Disposals of non-radioactive solid wastes are subject to statutory regulations issued under the Environmental Protection Act 1990. Commercial, Industrial, Special and Clinical Wastes, including materials sent for recycling, are disposed of only through licensed contractors according to the procedures required under the regulations. Many successful ideas for improvement in the management of wastes have come from the work groups where the wastes are produced.

Special waste includes particular chemicals, oils, solvents and materials contaminated with these (e.g. rags), for which special arrangements are legally required. During the 2 year period of this Environmental Statement 159.8 m3 of oily chemical waste (liquid and solid) and 25 tonnes of lead acid batteries were sent for recycling. Another 70 tonnes of miscellaneous wastes were dispatched as Special Waste. Special waste produced during this period was reduced from the previous two years (1998-2000) by as much as 36 %, a remarkable achievement, due mainly to the responsible attitude to waste production engendered amongst the Station staff.

Commercial waste includes paper, plastics, cardboard and other wastes from office areas. Industrial waste includes scrap metals, wood, inert building materials and other wastes from plant areas. The Station segregates this waste so that recyclables can be dealt with more easily by the waste contractor. 606 tonnes of commercial and industrial wastes that were not practicable to recycle were disposed of at a licensed landfill site. This is considerably less than in previous years (1998-2000 showed 2174 tonnes being sent to landfill) and, is the result of responsible attitudes to waste production by members of staff and contractors.

Industrial & commercial waste sent to landfill



Paper use & waste

Paper manufacture uses natural resources and energy, and substantial quantities of paper are used at Sizewell B. Efficient working practices are encouraged making use of computers, electronic documentation and communications, and these are being further developed. This report, for example, is on the company website “www.british-energy.com”.

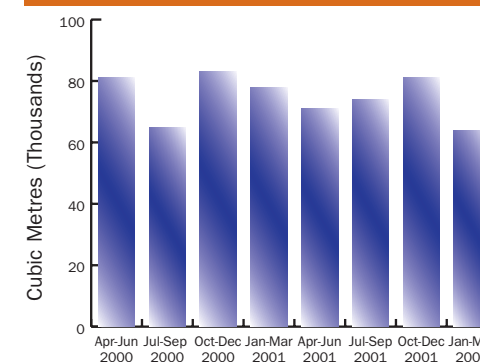
There are facilities for paper recycling in all offices, but until recently the glut of supply in the waste paper market has made it unrealistic to find a local contractor who will actually recycle this material. Consultation is now ongoing with the waste contractors to discuss the viability of paper recycling once more. This move has partly come about due to staff concern at the lack of recycling.



Water use

Towns main water is used in large amounts in the process. Where practicable, it is recycled around the plant in closed circuits and re-used many times. However, purging is necessary to control the chemical purity of the remaining water, in order to reduce corrosion in plant equipment. A modification has been made to the condensate polishing plant, which has reduced water use substantially. For several years the station has targeted the reduction of water consumption, and many ideas from staff who work in plant areas have been implemented successfully. There has been an overall reduction in water use of 17 % since the last EMAS statement. Reduction of water use is all the more important in this dry region of East Anglia despite the last two years being amongst the wettest on record.

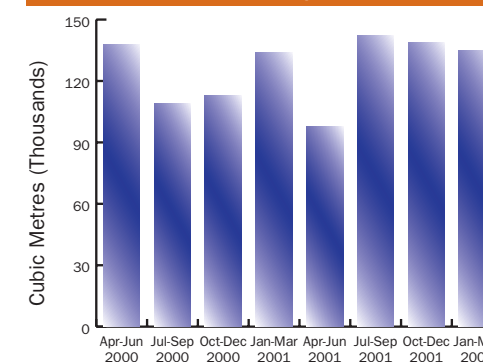
Water use



Electricity use

Apart from heating, lighting and computer equipment, in offices, workshops and the restaurant, electricity is also used to drive important equipment in the process. Efforts have been made to reduce electricity usage in all areas. Modern energy-efficient technology and equipment is already used extensively. The largest users are the cooling water circulation pumps; boiler feed pumps and water treatment pumps, which run almost continuously. The electricity consumed by the major pumps is monitored and pump operation is optimised to maximise efficiency. To save electricity one of the four main seawater circulation pumps is not run during the winter months when the sea water temperature is low enough to allow this.

Electricity use



SIZEWELL B PROCESS

Auxiliary Combustion Plant

Auxiliary diesel generators and boilers are operated infrequently, but are available as a back up for power and steam supplies essential to the safety of the power station.

Incinerators

The incinerators burn small amounts of dry solid low level radioactive wastes such as paper, wood, cardboard, protective clothing and rags from radiation controlled areas, with oil. Incineration reduces the volume of these wastes and the majority of the radioactivity remains in the ash.

Radioactive Wastes

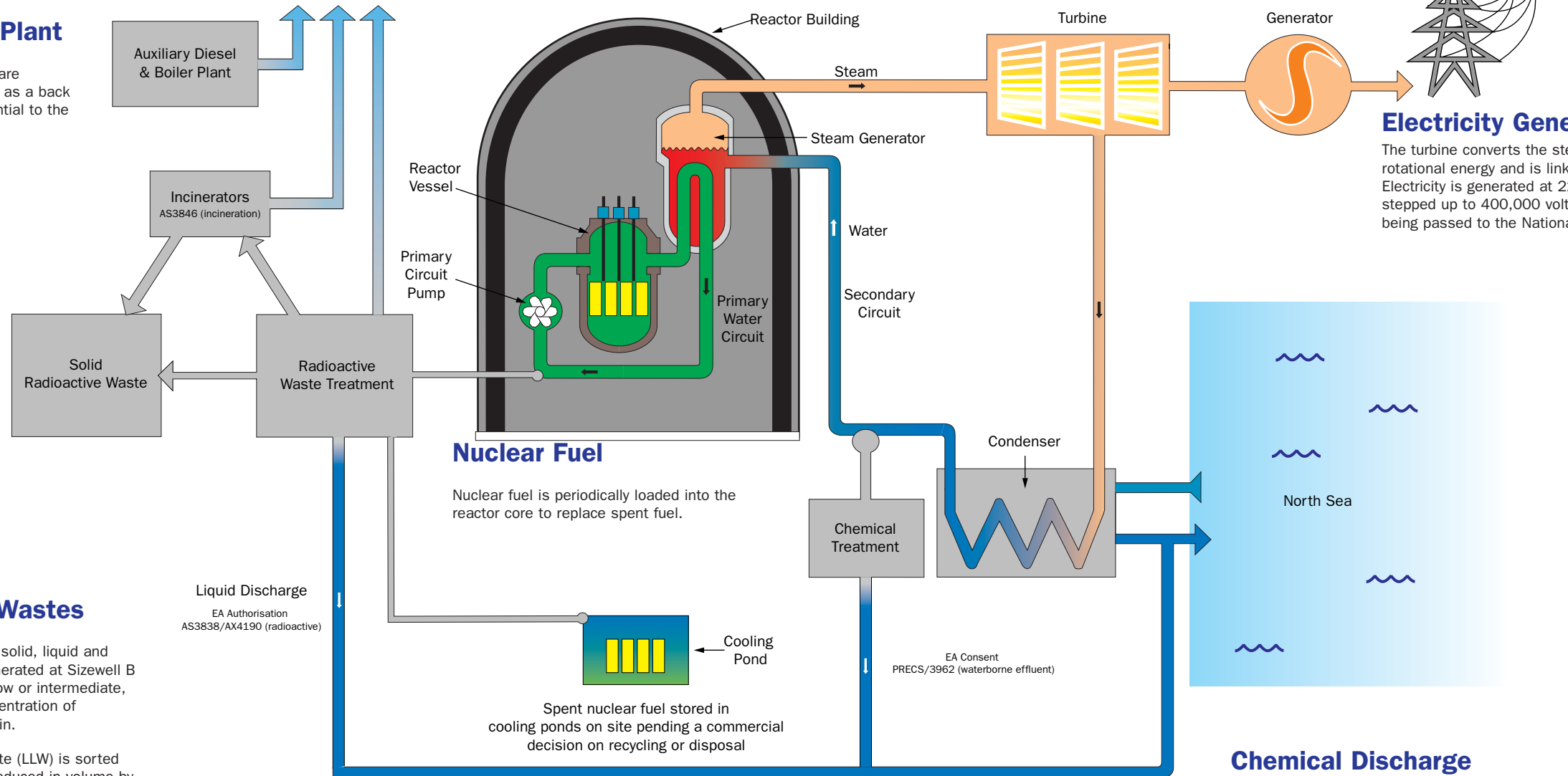
Radioactive wastes, in solid, liquid and gaseous forms are generated at Sizewell B and are classified as low or intermediate, depending on the concentration of radioactivity they contain.

Dry solid low level waste (LLW) is sorted and, where possible, reduced in volume by compaction or incineration. Wet low level wastes (resins, cartridge filters and evaporator concentrates) are encapsulated in cement. These solid radioactive wastes will then be sent for disposal at the BNFL facility at Drigg in Cumbria.

Intermediate Level Waste (ILW) includes resins and filter cartridges from the treatment of primary circuit water, and is encapsulated in cement within specially designed drums.

Gaseous Discharge

EA Authorisations
AS3820 (radioactive)
AF8017 (combustion plant)
AI3470/AV6957 (incinerators)



Technical Data

Sizewell B has, at its heart, a single Pressurised Water Reactor fuelled by Uranium Dioxide (UO₂).

Mass of UO ₂ in the reactor:	101 tonnes
Reactor Vessel dimensions:	13.6 m high 4.4 m diameter
Primary Circuit Water Pressure:	155 bar
Reactor Thermal Power:	3411 MW
Steam Conditions at the Turbine:	66.6 bar 282 °C 955 kg/sec
Turbine Speed:	3000 rpm
Condenser Sea Water Flow:	53 m ³ /sec max
Gross Electrical Generation:	1250 MW
Net Station Electrical Output:	1188 MW

Electricity Generation

The turbine converts the steam energy into rotational energy and is linked to the generator. Electricity is generated at 22,000 volts and then stepped up to 400,000 volts by transformers before being passed to the National Grid for distribution.

Radioactive Waste Treatment

This facility removes radioactivity from liquid and gaseous effluent streams by filtration, ion exchange and sometimes evaporation. The effluent is discharged to the environment. The radioactivity removed is retained in solid material, which is easier to handle, store, dispose of or recycle.

Chemical Treatment

Chemical treatment maintains the quality of the water in the secondary circuit, but results in the generation of some chemical wastes. Efforts are made to reduce and neutralise any discharges.

Chemical Discharge

This effluent discharge is mainly seawater that has been used for cooling the main turbine condensers. Other components include effluents from site systems, site drainage and authorised discharges from chemical waste treatment and radioactive waste treatment.

Occupational radiation exposure

Some staff and contractors do get exposed to radiation in their work. Radiation exposures at work are subject to the Ionising Radiations Regulations 1999, which require that exposures to personnel do not exceed limits, and that they are reduced further so that they are always "as low as reasonably practicable". Control is achieved by a combination of area designation, work control, safety documentation, area dose rate measurements, personal dose monitoring, competence training, procedural compliance, professional advice and supervision.

Radiation exposures are low by international comparison. During the 8 calendar quarters of this report radiation exposures at Sizewell B averaged 86 man mSv/quarter, a reduction of 38 man mSv/quarter since the last statement and well below the average for other operational PWRs which are above 200 man mSv/quarter.

Noise

Noise is produced by the major machinery and the public address system. It is monitored regularly on and off site. Occupational exposure is subject to the Noise at Work Regulations 1989. In consideration of our neighbours in Sizewell village, major machinery is not normally started or test-run at night and the public address system is only used in open site areas for safety and emergency purposes.

Transport

Staff are becoming more sophisticated in their use of technical developments such as video-conferencing, e-mail and the internet, and these are reducing the need for travel in many situations. Rail travel is not always practical, but is always considered. Low cost, fuel efficient, well maintained vehicles are used. Virtually all of these use diesel, which is more appropriate as most journeys made are relatively long. Shared use of vehicles is encouraged. Bicycles are provided where reasonable for site use. Staff are required to live within 25 miles of the station, bike sheds are provided and car schools are encouraged.

The designated heavy goods vehicle (HGV) route to the A12 trunk road, for delivery vehicles, keeps lorries away from residential areas of Saxmundham and Leiston. Transport of all goods to and from Sizewell B is by road. This includes nuclear fuel delivery. Neither used nuclear fuel nor any radioactive waste has yet been dispatched from site. No used nuclear fuel has been dispatched from site.

Effects on fish

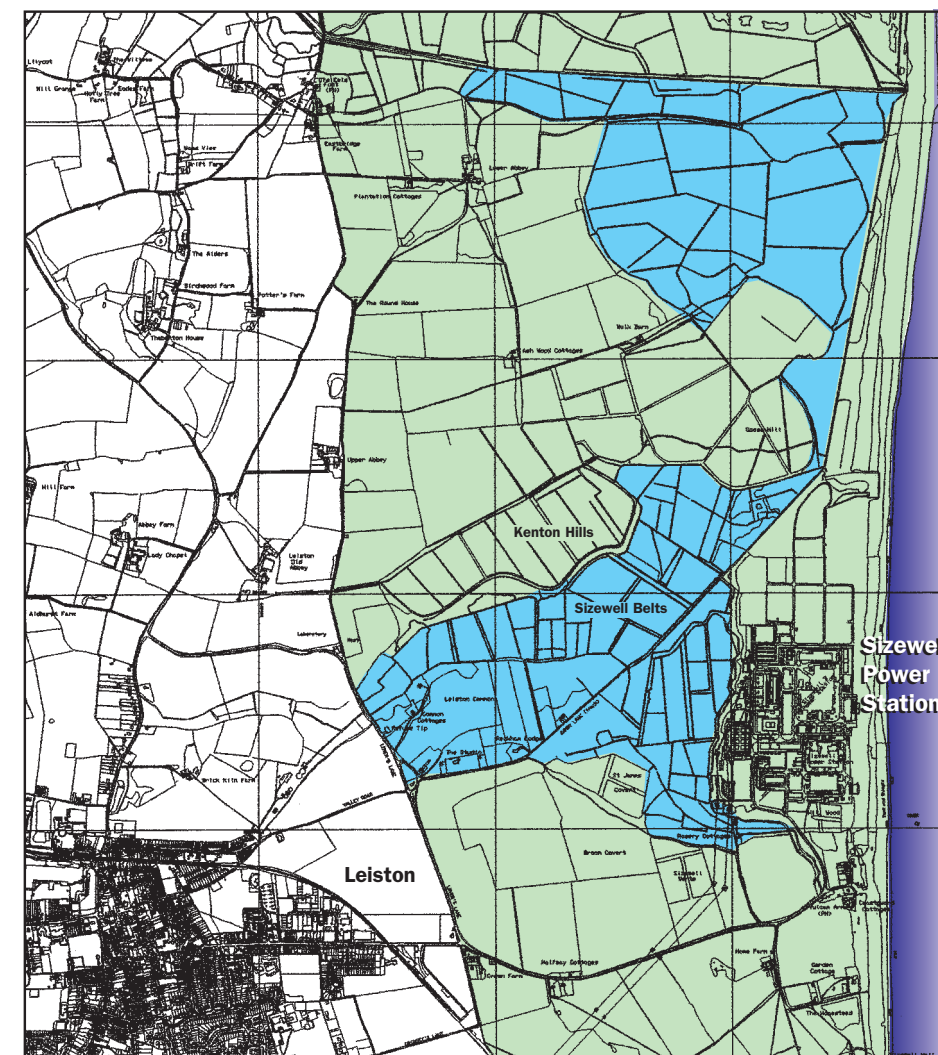
A large volume of seawater is used for cooling the turbine condensers. Screens are used to prevent damage to the plant from fish, driftwood and other materials that are inevitably drawn in. At Sizewell B these screens have a system for the return of fish to the sea. Tests by an independent aquatic research laboratory showed that, in all but the most extreme conditions, 80% of most species of fish are successfully returned alive to the North Sea.

Sewage

Sewage from both Sizewell A and Sizewell B power stations is processed in a facility managed by Sizewell A. The resulting liquid effluent enters the North Sea at the Sizewell A cooling water discharge point and is controlled by an Environment Agency discharge consent. Sizewell A power station has ISO 14001 and effluent from the sewage plant is considered significant in their environmental management system. The plant has run uneventfully for many years, but in February 2000 an underground pipe fractured causing a small localised spill of untreated sewage. This event was reported to the Environment Agency and was investigated according to station procedures.

Decommissioning

All industrial equipment should be responsibly disposed of at the end of its useful working life. Sizewell B was designed with this in mind. A design feature is that virtually all the components can be dismantled and removed. This is important for maintenance during the station's operational life as well as for end-of-life decommissioning. The Station Safety Report, which has been accepted by the Nuclear Installations Inspectorate, includes the principal arrangements for decommissioning.



Land management

Sizewell B is built on a plateau a few metres above sea level. The site was previously a mixture of farmland, woodland and areas of dense bracken. The operational area is in the "Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB)" / "Suffolk Heritage Coast". These were designated in 1969/1973, well after the establishment of a nuclear power station at Sizewell. The AONB has objectives of conserving and enhancing the natural beauty of the area, including flora, fauna, and landscape features, taking into account the needs of agriculture and industry, and particularly promoting sustainable social and economic development of local communities. Land management practices on-site and in particular the use of chemicals (herbicides/pesticides, etc.) is given particular thought.



Sea pea, a nationally rare plant, on the dunes at Sizewell

The beach immediately adjacent to Sizewell B has essentially been restored, in association with the University of East Anglia, as a large area of coastal dunes and shingle habitat. This now includes species such as horned poppy, restharrow, sea holly, sea pea, stonecrop, marram and other wild grasses.

British Energy's landholding includes the "Suffolk River Valleys Environmentally Sensitive Area" designated by the Ministry of Agriculture, Fisheries and Food, and the largely overlapping "Sizewell Marshes Site of Special Scientific Interest". The former is a voluntary scheme, and British Energy agrees to adopt the less intensive traditional forms of land management which helped to create the characteristic landscape and wildlife. The Site of Special Scientific Interest (SSSI) was designated by English Nature in 1987/1992 because of its importance as a large area of low wet meadowland and woodland. For the Sizewell Marshes SSSI the restrictions are very stringent and cover almost all agriculture and construction, the release/killing/removal of animals, the cutting or destruction of any plant, and the modification of watercourses and drainage. The marshes support a rich diversity of invertebrates, breeding birds, several nationally scarce plants, and otters, which colonised the area during the construction of Sizewell B. Vegetation monitoring on Sizewell Belts marshes shows a trend of continual improvement in species richness over a 6 year period. British Energy has engaged the Suffolk Wildlife Trust to maintain and enhance the Sizewell estate, providing public access where practicable.



Tree planting

In an area to the north of the station tens of thousands of conifers and broad-leaved trees were planted in a landscaped setting. These include trees specially selected for this windy, dry and sandy site, including alder, ash, birch, holm oak, maple, pine, oak, poplar, rowan, willow, sycamore and willow. The woodland is now 5 years old and contains 45,000 trees and shrubs.

Some areas of the estate were previously acid grassland and heath before modern farming practices destroyed much of this unique habitat. Wardens on the Sizewell estate are reverting 33.26 ha of this arable land back to acid grassland and heather has been reintroduced to large areas in addition to managing the existing heath. Lowland heathland is a rare and threatened habitat internationally, within the estate there are 65.9 ha of heathland, making Sizewell home to 2.33 % of the national total. Further to the north is the "Minsmere/Walberswick Heaths and Marshes SSSI", which is also a Special Protection Area and a Ramsar Site, as it is a wetland of international importance for waterfowl.

Each year the Station enters the BTO-Hanson Business Bird Challenge. Members of staff record the number and types of bird species in and around site. The intention of this challenge is to encourage firms to combine industry with care for the environment, as a proliferation of bird species is one sign of a healthy local ecology. Sizewell has a very good record in this challenge, having won first prize in the past. Currently the Station (in its category of electrical generators) is leading in this year's challenge with 106 species sighted in just the first 3 months of the year.

Local issues

The main forum for communications with the local community continues to be the Local Community Liaison Council (LCLC). It meets twice a year to keep local people informed about activities at Sizewell and to provide them with a forum to raise any issues of concern and have them dealt with by senior management. The Station Director chairs the LCLC, has a team of appropriate station specialists in support, and community representation is invited from local residents, local elected bodies and other important local groups. The LCLC is an important party with an interest in Sizewell B's environmental management, for example environmental policy and objectives are discussed with them, and results of routine radiological surveys are presented to them. Their views are taken into account. The debates are often lively and LCLC members appreciate the openness and responsiveness of the Sizewell team.

The station publishes fortnightly newsletters and these are circulated to LCLC members and others in the local community. They give details of emergency exercises, when there may be visits to site of emergency vehicles and when unusual sirens/alarms may be heard.

There is a designated local information telephone line run by the station for the benefit of local residents. The number is publicised by means of a free calendar that is distributed jointly with SZA at the beginning of each calendar year. The phone line gives general information regarding the operation of the Station. It also informs the public of forthcoming exercises and events.

The sponsored public recycling bank (for paper, glass, cans and charity donations to both Oxfam and Save The Children) at the Sizewell Sports and Social Club in Leiston is proving to be successful. It is used by the local community and the government's recycling credits are donated to Leiston Town Council.

There are positive and negative social and economic effects of having a power station in a sparse rural area. Staff live in the surrounding area and many contribute in a variety of ways to the community, for example voluntary activities in the community involving schools and young people, charities, clubs, conservation and village groups. Both station and staff buy goods and services from local businesses. A variety of local, mainly educational, projects are supported from limited funds contributed by British Energy and individual staff.

Examples of how Station funds have been used to help the local community are shown below:

We donated funds to enable Leiston library to develop its Internet suite

Saxmundham Saxon Fayre 2002 received a donation towards the event costs

We assisted with and helped fund the publicity/promotion for the Aldeburgh Poetry Festival-Festival Fringe

Funds were allocated to and assistance given for the Leiston Business Association Xmas Fayre

Leiston Primary School received equipment for drama workshops

Longshop Museum has been given a donation towards promotional costs as well as displays originating from the SZB visitor centre covering information on the Station, conservation and the environment.

A Donation towards outdoor play area/disabled access for special needs youngsters was given to Leiston Children's centre

Leiston Hockey Club was supplied with a new kit.

Leiston Gala 2002 was given a donation towards event costs

Brook Farm Playgroup, Saxmundham received a donation towards temporary premises/equipment

A minibus was donated to Leiston High School

Slaughden Sailing Club was given a donation towards safety equipment & training costs

Leiston Community responders were able to purchase defibrillation equipment after receiving funds from the Station.

The station has always welcomed visitors, they are shown around the operational site and their questions are answered, either by knowledgeable Visitor Guides or by technical specialists on the power station staff. British Energy runs a very popular website, www.british-energy.com, which includes extensive safety and environmental data on all the company's business units. This Environmental Statement can be found there.

Sizewell B is a major industrial establishment and has an emergency plan, which involves the participation of the civil emergency services in Suffolk. The local police, fire brigade and ambulance services all take part in exercises of the arrangements, including training at Sizewell B in realistic exercises of each aspect of contingency planning. This includes dealing with incidents involving radiation, fire, chemicals, casualties and evacuation. There is a very good professional liaison involved.

The millennium marque award for environmental excellence

British Energy at Sizewell B was pleased to win the Millennium Marque for Environmental Excellence in the year 2000. In order to win this prestigious award Sizewell B had to compete with other community and industrial environmental projects. British energy worked with the Suffolk Wildlife Trust to preserve and improve the Kention Hills woodlands and the Sizewell Belts water meadows. This is part of the SSSI and contains special habitats with a valuable diversity of flora and fauna. Footpaths were maintained and public access is encouraged to enable local people to enjoy this amenity. The judges were particularly impressed by the sensitive management of the "development of the environment around the power station and the involvement of local people, stakeholder groups and professional bodies". Winning this award is another tribute to staff's efforts and the Suffolk Wildlife Trust's work over several years.

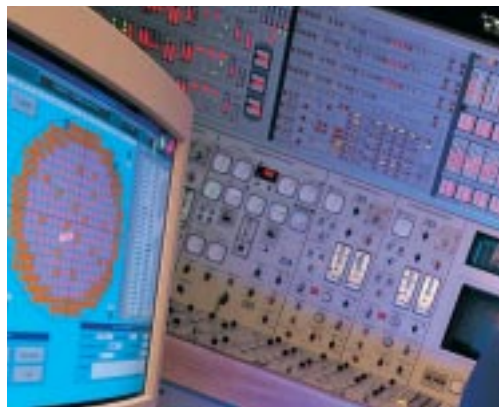
OBJECTIVES & RESULTS



Administration building



Enhancing habitats in the Kenton Hills



Sizewell B's main control room

Environmental performance objectives and targets have been in place since 1994. They are treated as other management objectives and targets, and are set for financial year periods. Environmental Objectives are used to raise the profile of issues and make expectations quite clear. The station identifies a person to lead the issue and resources are allocated for the planned achievement of the objective. This is normally done with a small team drawn from appropriate departments and different levels of work.

Environmental Objectives and results for 2000/01:

This was a successful year. Of the 6 declared Environmental Objectives 5 were achieved.

1 Meet all statutory radioactive discharge limits

Objective met. There was no breach of any annual radiological discharge limits although a quarterly notification limit for halogens was exceeded (see environmental events).

2 Meet all statutory chemical discharge limits

Objective met. There were no breaches in chemical limits.

3 Maintain ISO 14001 certification and EMAS registration

Objective met. Sizewell B has continuously maintained ISO 14001 since 1996 and EMAS since 1997.

4 Monitor and strive to reduce 'generation losses'

Objective met. Losses in generation are monitored daily in order to allow the station to get the most electrical energy from the resources used. The efficiency of many individual items of plant is monitored continuously and the results are reported at a daily 09:00 meeting. Over the year this led to significant resource savings.

5 Monitor and strive to reduce water consumption by 2%.

Objective met. Water consumption was reduced by more than 10 % this year.

6 Reduce Special Waste despatched from site by 10 %

Objective not met. Unfortunately the Station failed to meet this objective on the previous year's performance and actually increased the amount of special waste sent from site by just under 10%, due to additional tank cleaning work. Note, that despite this the overall amount of special waste has reduced over the last two years (see section on special waste).

Environmental Objectives for 2001/02:

1. Maintain systematic compliance with environmental protection legislation

Objective not met. Again there has been no breach of any radioactive or water discharge limit. However there was an exceedance of the particulate limit during incinerator emissions testing, which was reported to the Environment Agency.

2. Retain ISO 14001 certification and EMAS registration

An audit in November 2001 re-confirmed the station's ISO 14001 certification. EMAS registration was maintained throughout the year.

3 Volume of Low Level Solid Radioactive Waste produced < 15 m3

Objective not met. 22.8 m3 of LLW has been produced and is safely in store on site; this is higher than hoped for due to the unscheduled Outage in May 2001.

4 Volume of Intermediate Level Radioactive Waste produced < 5.4 m3

0.85 m3 of ILW has been produced and is safely in store on site.

5 Number of events that have to be reported to the Environment Agency < 2

There was 1 report to the EA (see above).

6 Reduce fuel, lubricating and insulating oil used

During the last year the quantity of oil used at Sizewell B has reduced - in particular Diesel fuel used in the Auxiliary Boilers.

7 Reduce key resources used, including town mains water

Town's water usage has been reduced for the fourth successive year and electricity consumption by the station has remained stable.

8 Reduce key wastes, including industrial, commercial and special waste disposed

Although there has been a minor reduction in these wastes from 306 tonnes to 300 tonnes per annum this is not a significant decrease and should be regarded as remaining stable. It must be stated however that a large amount of waste in 2001 was produced during an unscheduled Outage in May 2001 and was not therefore planned for.

9 Monitor corrective actions resulting from minor environmental events

All minor environmental events continue to be monitored and actions passed on to relevant personnel to be dealt with. Operational Experience Feedback (OEF) engineers follow up actions and the Environmental Officer reports the results to the Station Safety Management and Environmental Review Group (SMERG).

10 Monitor all Ozone Depleting Substances used, recycled and disposed

This continues. All refrigerants are logged onto a Station database, which follows Company Specification BEG/SPEC/SHE/ENVI/003. Disposal is monitored by Environmental Support waste team, treated as special waste and records kept accordingly.

Environmental Objectives for 2002/03:

- 1 Meet all statutory radioactive discharge limits.
- 2 Keep the volume of LLW produced to less than 20 m3.
- 3 Keep the volume of ILW produced to less than 6 m3.
- 4 Meet all statutory chemical discharge limits.
- 5 Comply with ISO14001 and EMAS.
- 6 Increase station interaction with the local community regarding environmental issues. *(Aimed to raise our standing in the eyes of the community and an opportunity to show that we care! Several measures are in process).*
- 7 Implement Environmental Awareness Group (Green Team).
- 8 Monitor and aim to reduce volumes of fuel and lubricating oil used.
- 9 Monitor levels of FRF used and strive to reduce usage by 10%.
- 10 Monitor key resources, such as town water and key wastes produced (such as industrial and commercial).
- 11 Keep special waste produced to less than 105 Te.
- 12 Update the HA (gaseous radwaste) monitoring system. *(Planned for June/July this year).*

Environmental Events

During refuelling outage, (September/October 2000) there was a breach in the quarterly halogen discharge to atmosphere consent. The EA were immediately informed and the release investigated. Steps were taken to prevent any further releases occurring and breach of the annual consent discharge levels was successfully averted. Further steps have also been put into place to prevent any a similar release occurring in the future.

There was one breach of consent from gaseous plant emissions during the last two year period when on 26/03/02 the Radwaste incinerator breached its particulates consent in an hour-long test run. As a result the event was reported to the EA and talks are now ongoing with an independent consultant into the necessary steps required to improve incinerator performance.

All the issues have been addressed in full consultation and agreement with the EA.

On October 12th 2001 a member of the public reported seeing what appeared to be oil on the surface of the water near to the Sizewell B outfall. He alerted the Station, which in response stopped all effluent discharges to sea and performed a check analysis of the surge chamber. In addition a check was made of all oil inventories. No anomalies were found. Sizewell B checked the beach and informed Sizewell A, but no oil was found. Further investigation showed that the oil like substance was in fact an algal bloom in the water and not related to the Station. In the last 2 years the station has received very few environmental complaints! Those who complained did so about the excessive speed of vehicles approaching and leaving the site and a complaint was received about leylandii trees surrounding and off-site store. The Estate workers in response to this removed the trees.



Inspection of new fuel

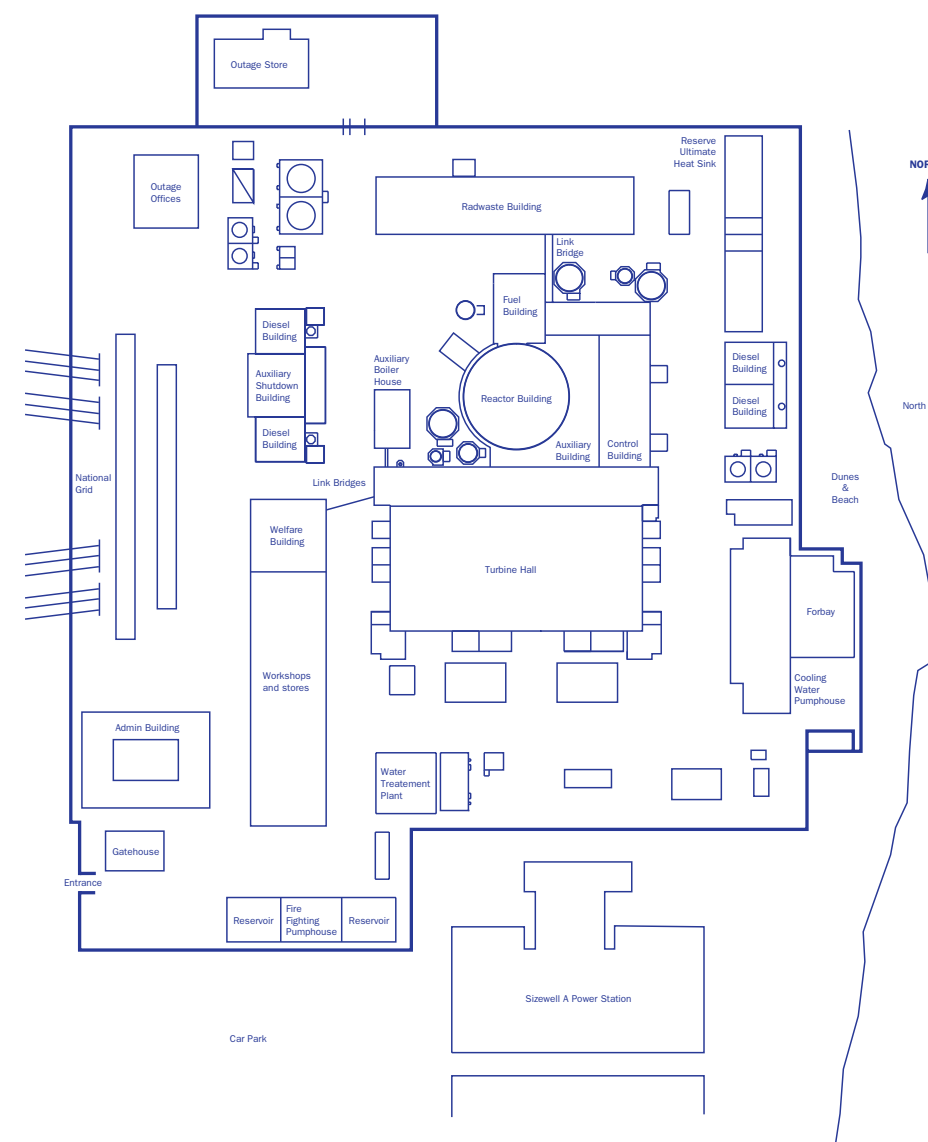


Sizewell Marshes SSSI

GLOSSARY

- Becquerel (Bq)** The Becquerel is the standard basic unit for radioactivity. 1 Bq is a very small amount of radioactivity. For example, a small (1 kg) bag of fertiliser contains about 2000 Bq. A megabecquerel (MBq) is a million Bq, a gigabecquerel (GBq) is 1000 million Bq, and a terabecquerel (TBq) is 1 million million Bq.
- BNFL Plc** British Nuclear Fuels Limited Plc.
- Critical group dose** This represents the dose that would be received by those people who are most exposed to radiation because of where and how they live. Different radionuclides can give rise to very different doses of radiation, depending on their half-lives, modes of decay and chemical behaviour. The doses quoted are too small to be measured directly and are derived from computer modelling.
- EA** Environment Agency (of England and Wales).
- EMAS** European Community Eco-Management and Audit Scheme.
- Half-Life** The time taken for the activity (radioactivity) of a given radionuclide to reduce by half
- milli sievert (mSv)** Radiation doses to man are normally expressed in millisieverts. The average annual radiation dose from natural sources in the UK is 2.2 mSv.
- micro sievert (uSv)** One thousandth of a millisievert.
- Man sievert (man Sv)** A unit of measure of the collective radiation dose received by a given group of people. In this case, the personnel at Sizewell B.
- Outage** A planned period of maintenance and refuelling, when the reactor is shut down. During an outage, water and electricity used in the normal operation of the station are not used to the same degree, and there is no electricity production from the station.
- Occupational** During normal operation of the station, occupational radiation exposure of staff is extremely small. During an outage, more access to radiation controlled areas is necessary, and staff working in these areas may be exposed to radiation. All exposures are strictly monitored and controlled.
- Radionuclide** Any nuclide (isotope of an element) that undergoes radioactive decay
- WANO** World Association of Nuclear Operators.
- SSSI** Site of Special Scientific Interest
- Sizewell B uses several quality standards as tools to improve and measure performance in quality, safety, human resource and environmental management. These include:
- 50-C-QA** Safety Standard for Quality Assurance for Nuclear Power Plants - International Atomic Energy Agency
- BS 5882** Total Quality Assurance for Nuclear Installations - British Standard
- ISO 14001** Environmental Management Systems - International Standard
- EFQM** Business Excellence Model of the European Foundation for Quality Management
- IIP** Investors in People
- ISRS** International Safety Rating System - Det Norske Veritas
- ROSPA** Gold Award for Occupational Safety (Royal Society for the Prevention of Accidents)
- WANO POs&Cs** WANO Performance Objectives and Criteria

SIZEWELL B SITE PLAN



Verification statement

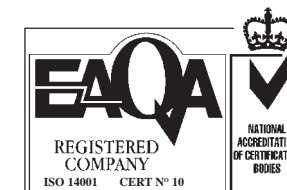
The information and data contained in this document have been verified as representing an accurate statement of fact and this environmental statement has been validated as meeting the requirements of EMAS.

[Signature]

Date: 11th September 2002.

Verification No: 022-C

Lead Verifier, EAQA Ltd
Accredited Environmental Verifier for EMAS





If you wish to know more about our environmental policies, objectives and performance, visit the British Energy website at www.british-energy.com, email us at karen.hayes@british-energy.com or write to:

**The Environmental Officer or
The Station Director**

**Environmental Support
Sizewell B Power Station
British Energy plc
Leiston
Suffolk IP16 4UR
United Kingdom.**

British Energy 