HARTLEPOOL

NUCLEAR POWER STATION

1988

YEARLY REPORT

INTRODUCTION FROM THE STATION MANAGER

Over the last few years we have introduced a number of initiatives at the power station which are intended to keep our neighbours fully informed of our activities. These initiatives have included the publication of a regular fortnightly news sheet and the appointment of a full time member of staff to assist in liaison with the local community.

However, perhaps the most far reaching initiative is the re-organisation of the long established Local Liaison Committee (L.L.C.). The L.L.C., consisting of representatives of the local community, appropriate local and national government departments and the emergency services, "has been meeting regularly at the power station since 1974 to receive reports on the activities of the station and discuss items of interest and concern.

During the past year we have improved this well established liaison by the introduction of the Local Community Liaison Council (L.C.L.C.) to replace the L.L.C.

The new L.C.L.C. includes amongst its members all those who attended the L.L.C. but has also been able to extend the representation of the local community to include a number of other groups and organisations such as local G.P.'s and Health Visitors, Headteachers, Women's Organisations and local Fishermen. The local media are also invited to attend the meetings.

In order to extend the availability of information regarding the power station I have decided to produce an Annual Report for presentation to the members of the L.C.L.C. based on the activities of the power station during 1988. The members of the L.C.L.C. have agreed that this report may be made available to an even wider readership in the local community.

I hope that you will find the report interesting and useful. If you have any comments on the content or suggestions for future issues I would be very pleased to hear from you.

Clive Smitton

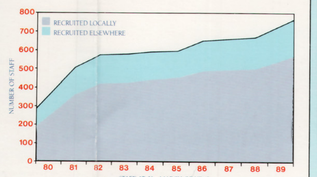
AN INTRODUCTION TO HARTLEPOOL NUCLEAR POWER STATION

Hartlepool Power Station is situated on the Tees estuary near Seaton Carew, 4 miles south of Hartlepool. The station has two Advanced Gas Cooled Reactors (A.G.R.) each generating steam to drive a 660 MW Turbo-generator. When fully operational these two units are able to supply nearly twice the maximum power needs of the County of Cleveland.

The Station has been feeding electricity into the National Grid System since 1984.

Over 700 people are permanently employed by the Power Station which is a major contributor to the economy of the local area, injecting millions of pounds per year by means of salaries and its use of local services.

STAFFING LEVEL



THE MEN WHO RUN THE POWER STATION

DR CLIVE SMITTON — STATION MANAGER

Dr Clive Smitton started his career working for the Atomic Energy Authority at Harwell.

In 1971 he joined the CEGB's Scientific Services Department, North Western Region, and was promoted to Head of Engineering Science, North Western Region in 1977.

Four years later he was appointed Deputy Manager of Hinkley Point 'A' Nuclear Power Station in Somerset and in 1982 Deputy Manager with site responsibilities covering both the 'A' (Magnox) and 'B' (A.G.R.) stations at Hinkley Point.

Dr Smitton was appointed Manager at Oldbury Nuclear Power Station near Bristol in 1983 and in early 1986 took over as Manager at Hartlepool.

As Station Manager he is responsible for the general management of the Power Station which is a very large business in its own right, employing over 700 people and with a financial turnover in 1988 well in excess of £100 million. In addition he is responsible on behalf of the CEGB for ensuring that all activities are carried out in accordance with statutory and other relevant regulations and codes of practice to ensure safety of personnel, plant and equipment and also that the station operations have the least possible effect upon the environment.

The Station Manager must also ensure that an effective Emergency Plan, regularly exercised and approved by Health and Safety Executive inspectors, is available for immediate implementation in the unlikely event of a major incident at the Power Station. Dr Smitton is married with two children.

The Power Station is divided into four main departments each headed by a member of the Station Management team.

DEREK FOWLER — ENGINEERING MANAGER

Derek Fowler started his career in the nuclear industry as an apprentice with the United Kingdom Atomic Energy Authority (UKAEA) at their Preston factory where fuel elements for civil reactors are made.

After qualifying as an electrical engineer he moved to the UKAEA establishment at Dounreay where for the following twelve years he held various engineering posts.

Mr Fowler joined the CEGB in 1973 at the Heysham 1 Power Station as Control and Instrumentation Engineer. In 1977 he was appointed as Technical Services Manager at Heysham and in 1986 took up the position of Resources Manager.

In January 1988 he came to Hartlepool as Engineering Manager.

THE MANAGEMENT TEAM

Back Row: L to R ALAN GITTINGS DR CLIVE SMITTON DEREK FOWLER
Front Row: L to R TONY CAPP BILL SHIRRA

The Engineering Department carries out all engineering work on the Power Station, mechanical, electrical and instrument. Department staff also supervise all contractors working on the site, arrange and supervise major overhauls as well as carrying out many specialist tasks such as reactor internal inspections and the provision of documentation to satisfy CEGB and government regulations.

The Engineering Manager is also responsible for Chemistry on the Station and for the Plant Performance section who continually monitor that the plant is being operated in accordance with all the appropriate documents and specify reactor conditions including re-fuelling requirements.

Mr Fowler is married with two children.

TONY CAPP — PRODUCTION MANAGER

Tony Capp began his career as an apprentice with The General Electric Company at their Erith works where a complete range of steam turbines were manufactured.

On completion of his apprenticeship he spent two years with GEC installing and commissioning some of the largest turbines of the time.

He joined the CEGB at Dungeness Nuclear Power Station in 1963 and then held a variety of positions of increasing seniority at a number of CEGB coal fired stations including four years at Drax during the commissioning of the first two units.

In 1974 Mr Capp was appointed as Shift Manager at Heysham 1 Nuclear Power Station where he remained during the complete commissioning and early running of both reactor/turbo-generator units.

THE MEN WHO RUN THE POWER STATION

In early 1986 he went to Ince B Power Station as Resources Manager and later the same year was appointed as Production Manager at Hartlepool. The Production Department is responsible for the safe and efficient operation and maintenance of the Power Station 24 hours per day, 365 days of the year, to the very high standards laid down in Government and CEGB regulations.

Mr Capp is married with two children.

ALAN GITTINGS — RESOURCES MANAGER

Alan Gittings is the longest serving member of the Hartlepool Management team having joined the Station as the Planning Engineer during the construction period in 1972.

His early career was with the National Coal Board where he trained and qualified as a Mechanical Engineer. Following National Service in Royal Air Force he joined the CEGB as a Test and Efficiency Engineer working on a conventional coal fired plant in the Midlands Region. Mr Gittings transferred to the Nuclear side of the industry in 1965 when he was appointed to the first of the three posts he held at Sizewell Nuclear Station during its commissioning and early operational period, before joining Hartlepool in 1972. He was appointed Resources Manager in 1975 and this position was redefined and expanded to his current appointment in 1986.

The Resources Department ensures that all the resources necessary to operate and maintain the Power Station are available when they are required.

The department is also responsible for specifying and monitoring the quality of every activity on the Power Station.

The Health Physics section which is responsible for radiological safety and environmental monitoring is part of the Resources Department as is also the Training Section which ensures that all staff are properly trained for both their normal duties and duties under emergency conditions.

Mr Gittings is married with two children.

VISITOR RECEPTION

BILL SHIRRA — ADMINISTRATION MANAGER

Bill Shirra joined the Board at Rotherham Power Station in 1976 from Tarmac Construction. Through a succession of administrative appointments involving Personnel and Procurement work he came to Hartlepool in 1984 as deputy Administrative Officer. This role involved general management together with the specific area of Finance. At the end of 1985 he was promoted to head the Administrative Department. Part of this role is to be the L.C.L.C. Secretary, a role which he particularly enjoys.

The Administration Department is responsible for four main work areas, being Financial Services, Personnel Support, Procurement Administration and Other Services. The latter services involve managing the security of the Station, providing House Services (Catering, Housekeeping and dealing with visitors etc) and keeping statutory and other records. A further important aspect is to assist the Station Manager with fostering good community relations. Mr Shirra is married.

PRODUCTION REPORT

Every year the CEGB sets a target for the production of electricity from each of its 74 power stations. This target takes into account all the work planned for the year ahead such as overhaul and maintenance of equipment and re-fuelling of reactors. Experience in all power stations shows that with such large and complex installations there will also be some unplanned shut down caused by equipment faults and an allowance is made for this when deciding upon a production target.

Fig 1 represents the target set for Hartlepool power station during the year 1988. Almost 70% of this target was achieved.

Of the 30% of total station output which was not achieved, almost half was a result of a leak of carbon dioxide gas from a small instrument pipe on Reactor 2. The pipe passes through the concrete of the pressure vessel and was not readily accessible, the end of the pipe which required sealing being within the reactor pressure vessel. An attempt was made to seal the pipe using remotely operated equipment but whilst the exercise was successful in effecting a marked improvement it failed to seal the pipe completely. It was therefore necessary for men to enter the pressure vessel and a cap was successfully welded over the faulty pipe enabling the reactor to return to service.

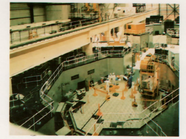
Apart from this difficulty Reactor 2 operated well throughout the year.

During the planned major overhaul of Reactor 1 which took place in late 1987 and early 1988, flow restrictors were fitted into the end of each individual boiler tube in order to improve overall performance. Several thousands of these restrictors were fitted and it was anticipated that there would be some small water leaks from the restrictor seals. Rather more of these leaks occurred than expected and this resulted in an 8.9% shortfall in total station output (Fig 1) whilst repairs were carried out.

In addition to the necessary repairs these restrictor seal problems meant that the reactor was operated on three rather than four boilers for part of the year with a resultant 4.5% reduction in planned station output.

The remaining shortfall of 2.2% was mainly a result of two lubricating oil leaks which occurred on No 1 main turbo-generator oil system.

In spite of the difficulties experienced during the year the power station sent out over 2,000 million units of electricity into the National Grid System, equivalent in energy terms to approximately 800,000 tonnes of coal and worth over £100 million at retail prices.



REACTOR PILE CAP

1988 STATION PERFORMANCE

ACTUAL — 2036 GWHr PLANNED — 2923 GWHr

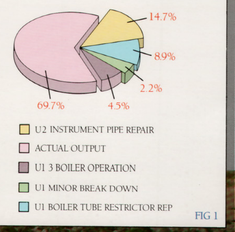


FIG 1

PLANT RELIABILITY AUTOMATIC SHUT DOWN RATE IMPROVEMENTS

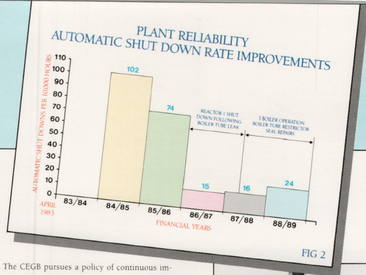


FIG 2

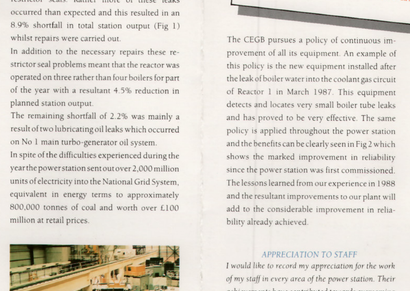
The CEGB pursues a policy of continuous improvement of all its equipment. An example of this policy is the new equipment installed after the leak of boiler water into the coolant gas circuit of Reactor 1 in March 1987. This equipment detects and locates very small boiler tube leaks and has proved to be very effective. The same policy is applied throughout the power station and the benefits can be clearly seen in Fig 2 which shows the marked improvement in reliability since the power station was first commissioned. The lessons learned from our experience in 1988 and the resultant improvements to our plant will add to the considerable improvement in reliability already achieved.

APPRECIATION TO STAFF

I would like to record my appreciation for the work of my staff in every area of the power station. Their achievements have contributed towards overcoming our difficulties during the past year and helped to build a secure foundation for future operation.

Clive Smitton

MAN WORKING INSIDE PRESSURE VESSEL



BOILER TUBE RESTRICTOR: WHICH REGULATES THE WATER FLOW THROUGH EACH BOILER TUBE. EACH TUBE IS ONLY APPROXIMATELY 1CM IN INTERNAL DIAMETER AND THERE ARE ALMOST 2 500 TUBES IN EACH REACTOR.

PROGRESS TOWARDS PRIVATISATION

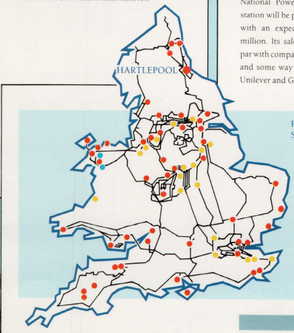
For over 30 years the CEGB has owned and operated the power stations and main transmission lines, known as the National Grid System, and has been responsible for the bulk supply of electricity to the 12 Area Boards of England and Wales. The CEGB system consists of 74 power stations with a maximum output capacity of over 54,000 MW feeding into the National Grid network of over 7,600 kilometres of main transmission lines — the world's largest fully-interconnected system under unified control.

Under the Government privatisation proposals the CEGB will be divided into three separate companies. The two generation companies will be National Power, which will consist of 70% of the existing capacity including all the nuclear power stations, and Power Generation which will be formed from the remaining 30%. The Grid System will become a separate company under the common ownership of the 12 privatised distribution companies but effectively independent for operational purposes.

Considerable progress has already been made towards reorganising the CEGB in line with the government proposals. Almost all employees are now aware of which company they will be working for and the CEGB has already been divided into divisions which correspond to the new companies.

These divisions became operational on 1st January 1989 and it is envisaged that by 1st January 1990 they will be up and running as the successor PLC's ready for flotation, subject to the successful passage of the Electricity Bill through Parliament.

National Power, of which Hartlepool power station will be part, will be a very large company with an expected turnover of some £5,000 million. Its sales performance will put it on a par with companies like British Gas and Shell UK and some way ahead of household names like Unilever and GEC.



TRAINING

The CEGB has always been acutely aware of the importance of thorough training of its nuclear power station staff not only on initial appointment but also with regard to regular refresher training in order to ensure that their skills are practised and their knowledge updated.
The power station maintains a training section to ensure that all specified training is carried out and that records are maintained for independent audit.
In addition to training carried out on site, all shift engineering staff, who are responsible for the actual operation of the reactors, attend regular refresher training at the CEGB Nuclear Power Training Centre at Oldbury-upon-Severn.
The Training Centre maintains full scale reactor simulators for all the CEGB reactors which can realistically reproduce not only normal operational conditions but all manner of fault conditions.

HARTLEPOOL SIMULATOR

Every Hartlepool reactor operations engineer must attend the Centre for training on the Hartlepool simulator every year in order that conditions not normally met in routine operation may be practised. This training ensures that should any fault condition arise during operation of the reactors at Hartlepool the operating staff are familiar with the behaviour of the reactor and the actions required to safely deal with the situation.

Published by Department of Information and Public Affairs, Beckwith Knowle, Harrogate.

THE ENVIRONMENT

The operation of a nuclear power station results in the need to discharge small amounts of radioactivity into the environment. This is in the form of:

(a) Liquid Effluents – low activity water treated and monitored before dilution and discharge into the sea.
(b) Gaseous Effluents – carbon dioxide coolant filtered and monitored before discharge.

Legislation to restrict radioactive discharges to acceptable levels is provided under the Radioactive Substances Act 1960. These discharges may be made only in accordance with authorisations issued by the Secretary of State for the Environment and the Minister of Agriculture, Fisheries and Food, whose aim is to set numerical limits on radioactive effluent discharges that reflect upon site operations, available techniques to control the radioactive content of waste and the possible radiation exposure resulting from discharges. The operator is normally required to demonstrate that the radioactive content is limited by the best practicable means and that any exposures are as low as reasonably achievable (ALARA). Discharges from Hartlepool and other CEGB power stations are generally well below the authorised limits in accordance with the ALARA policy, with typical annual discharges at Hartlepool less than 3% and 2% of the authorisation limits for liquid and gaseous effluents respectively.

Extensive environmental surveys are carried out at all CEGB nuclear power stations to demonstrate that radioactive discharges do not result in any significant increase in the level of radiation or radioactivity around the stations. A habit survey by the Ministry of Agriculture, Fisheries and Food in 1973 determined the critical pathways around the Hartlepool coastline by which radioactivity could enter the food chain and hence find its way to man. Based on the results of this habit survey a comprehensive district survey programme, which includes analysis of shellfish, fish, crustacea, seaweed, seacoal, sediment, seawater, milk, herbage and soil, began around the station in 1976 prior to any fuel loading to establish radiation background levels.

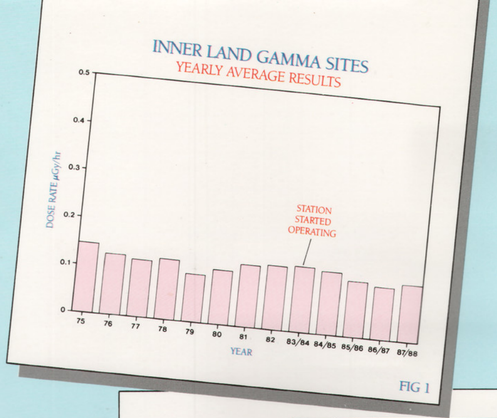


FIG 1

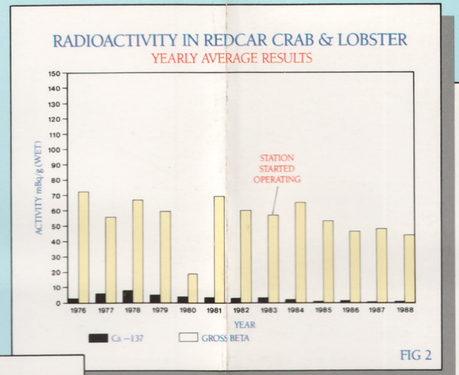


FIG 2

THE ENVIRONMENT

Reactor 1 was made critical and taken to low power for the first time in June 1983, with Reactor 2 following in September 1984. The Figures show the variation in gamma radiation dose rates near to the power station (FIG 1) and the variation in crab and lobster radioactivity caught at Redcar (FIG 2) from 1975-1988 and 1976-1988 respectively. There is no overall trend indicated in either case. These are typical of environmental monitoring results and demonstrate that reactor operation at Hartlepool has generally resulted in no increase in detectable environmental radiation levels. Independent results from the Authorising Ministries show very close agreement with results obtained by the station's professional Health Physics department.
The CEGB will continue with its environmental survey programme throughout the life of the power station. The results of these surveys are reported quarterly to the Authorising Ministries who have the responsibility for publishing results for all operating nuclear establishments.
The results are also presented to the Local Community Liaison Council on an annual basis. It is anticipated that future comparisons between pre-operational and operational data will continue to demonstrate that Hartlepool Power Station has a negligible effect on the radioactive environment.

AREA 9, ENERGY INFORMATION CENTRE.

PUBLIC RELATIONS

A successful Open Weekend was held at Hartlepool in July 1988 which attracted about 18,000 people. Over £3,000 was raised by staff and visitors towards the Royal National Lifeboat Institute who gave demonstrations over the weekend. In addition 8,000 visitors toured the station over the year. An advertising campaign also appeared in the local media inviting people to tour the power station.

VISITORS AT THE OPEN WEEKEND

The Energy Information Centre "Generations of Energy" show attracted 35,000 visitors, mainly school children, more than double the previous year's attendance figures.
The Teesmouth Field Centre which is supported by the CEGB also attracted several thousand visitors, again mainly school parties, over the year.
The fortnightly newsletter giving details of all the station's activities, has continued to improve local communications. The newsletter, sent to all L.C.L.C. and E.P.C.C. members, is also distributed to local libraries, the media, local MP's and many other interested organisations and individuals.
In addition to these activities, the CEGB's energy talks service provides speakers to address any organisation, including schools and colleges on all aspects of energy supply.
All speakers involved in the North East, including 16 at Hartlepool, are engineers and scientists, who undertake this work on a voluntary basis.

TECHNICAL SUPPORT OFFICER

A full time member of staff has been appointed to assist the Station Manager in fostering close links between the station and the local community.
Harry Howorth, who has been a shift charge engineer at the station since 1971, has been appointed to the position of technical support officer.
Mr. Howorth previously worked at a number of coal fired stations before moving to Hinkley Point, a nuclear power station in Somerset in 1961 and to Hartlepool ten years later.
Mr Howorth is married with two children.

LIFEBOAT DEMONSTRATIONS WERE ONE OF THE ATTRACTIONS AT THE OPEN WEEKEND AND OVER £3,000 WAS RAISED FOR THE RNLI

HARTLEPOOL NUCLEAR POWER STATION

CEGB NATIONAL POWER DIVISION