

Hazard reduction in safe hands

Magnox South Achievements 2008





Welcome to Magnox South's second Achievements Brochure

It has been a successful year and I am confident in the knowledge that Magnox South is performing well and delivering value safely to the tax payer. Thanks to the flexibility and enthusiasm of our workforce – and primarily through self-performing work – our innovative approach has generated more than £46m worth of efficiency savings. The Nuclear Decommissioning Authority (NDA) has currently approved in principle in excess of £30m of savings. This year has also provided some major milestones including the introduction of our new Parent Body Organisation (PBO), EnergySolutions and the start of Shadow Working, providing an opportunity to demonstrate to the satisfaction of the regulators that arrangements are in place for the separation of Magnox Electric Ltd into two companies.

Although principally focusing on the highlights of 2007/08, I wanted to record some of the achievements back to April 2005 – when the NDA came into being. Three years is a long time as a contractor and while this document cannot capture everything we have done, it does provide a taste of what has been safely achieved – often through innovation. Set this against a background of almost constant change and funding challenges – and it is even more impressive.

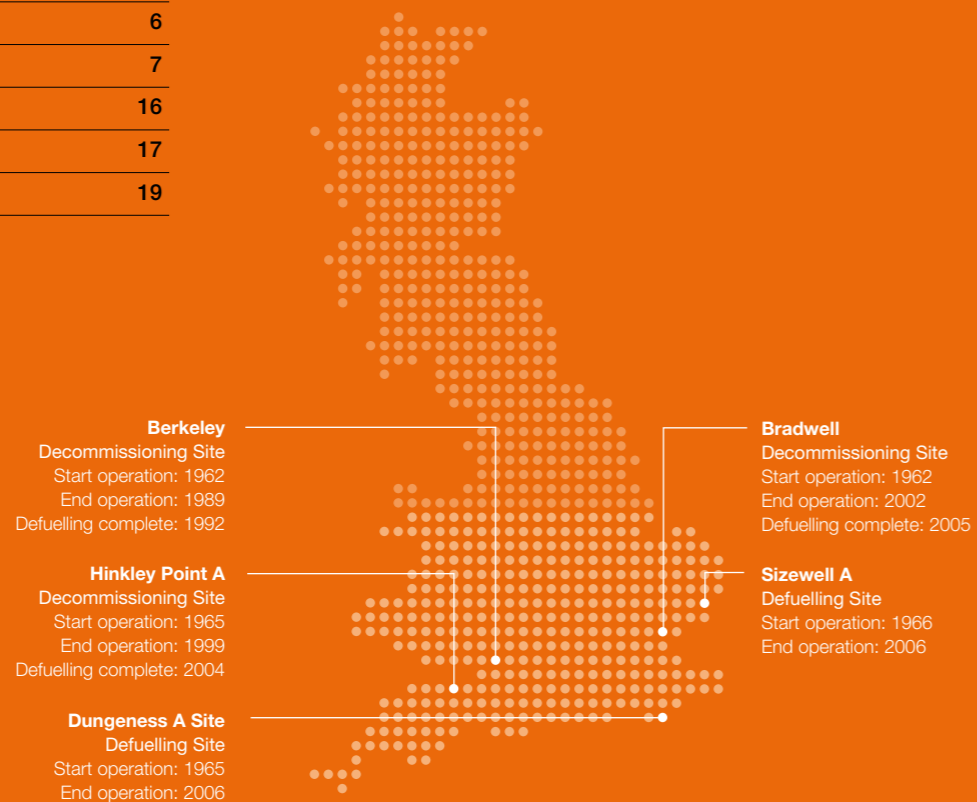
This brochure highlights our continued delivery against our plan – enjoy reading it.

Ken Powers Managing Director, Magnox South



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Safety

Magnox South's safety performance during financial year 2007/2008 has continued to be excellent. The Health and Safety Executive (HSE) took no enforcement actions and Magnox South met its target for TRIR (Total Recordable Injury Rate) by keeping it below 0.3. There were three reportable injuries during the year, none with serious or lasting consequences.

Since the Nuclear Decommissioning Authority (NDA) came into being in April 2005 Magnox South has worked hard to maintain a strong safety culture as a contractor to the NDA. "Always think safety first" is the approach to all jobs and decisions.

In March 2008, Magnox South's first Safety Representatives' Conference was held. After being designed by the Health and Safety Advisory Committee the conference aimed to provide a forum for safety representatives to share ideas and help contribute to making a positive safety difference across the company.

Magnox South's Environment, Health, Safety, Security and Quality Director, Ray Jepps and NDA representatives attended the conference and the event has been termed best practice for the industry.

This conference shows the commitment that Magnox South has made to safety and the achievements from across the company below reinforce this:

RoSPA

Year after year Magnox South sites perform well at the Royal Society for the Prevention of Accidents (RoSPA) Awards. This year the winners were:



Magnox Electric (Magnox South prepared the entry) won a major award in the Engineering Construction sector

Berkeley: President's Award

Bradwell: Gold Medal Award

Dungeness A: Gold Medal Award

Hinkley Point A: President's Award

Sizewell A: President's Award.

ISO Standards: In 2007/08 all sites remained accredited to the ISO standards 9001, 14001 and OHSAS 18001.



Celebrating success at the 2007 RoSPA Awards Ceremony

Berkeley

• **62 weeks without a Lost Time Accident (LTA)**



• 1,009 behavioural safety observations in 2007/08.

• 75% of people trained as behavioural safety observers.



Dungeness A

• **Five years (2,000 days) without an LTA or RIDDOR reportable accident**



• 1,863 behavioural safety observations in 2007/08.

• 180 people trained as behavioural safety observers.



Bradwell

• **69 days without an LTA**

• 3,094 behavioural safety observations in 2007/08.

• 40% of people trained as behavioural safety observers.

• Bradwell self-performed the nationally recognised Institute of Occupational Safety and Health (IOSH) training for staff on site. One hundred staff completed the one-day Working Safely course and 45 the four-day Managing Safely course – with a 100% pass rate.



Sizewell A

• **480 days without an LTA at the end of 2007/08**

• 3,290 behavioural safety observations in 2007/08.

• 26% of people trained as behavioural safety observers.



Hinkley Point A

• **275 days without an LTA (at Monday 21 April 2008)**

• 2,865 behavioural safety observations in 2007/08.

• More than 90% of people trained as behavioural safety observers.

• Launch of the Precursor to Event or Accident Report Log (PEARL) System in August 2005 revamped the site reporting culture. This reporting form captures standard situations. It is used to inform management of any shortfall in expectations. Staff at all levels, and contractors, are encouraged to complete PEARL forms.

• Launch of the Pearl Observation Point of Work Safety Assessment (POP) book in August 2007 which combines Point of Work Safety Assessment, Behavioural Observations and the PEARL system. The new POP Forms have been very successful and have helped to increase the level of reporting on site.



Spent fuel

Three of our five sites have now completed defuelling, with all spent fuel safely transported to Sellafield for reprocessing. Dungeness A and Sizewell A are now preparing for final defuelling in accordance with the recently published Magnox Operating Programme (MOP) 8.

Bradwell completed reactor defuelling at the end of 2005. Following stringent back out checks of the cooling pond, the Nuclear Installations Inspectorate shared our confidence that the site was free of spent fuel. This resulted in a NUMEX trophy for excellent defuelling performance, beating competition from other projects across Europe. It is the second time that the site has been awarded the prestigious trophy.

Dungeness A began its three year final defuelling programme in April 2008.

Meanwhile at **Sizewell A**, a ten tonne defuelling trial has been successfully completed to prepare for final defuelling which is expected to start in 2009.

The trial was carried out in strict accordance with testing and commissioning procedures and consisted of defuelling two standpipes on each reactor, as well as removing fuel from 58 thermocouple channels. A total of 122 channels of fuel were removed, equating to 854 fuel elements.



Spent fuel being safely transported to Sellafield for reprocessing



Defuelling trial of the reactors at Sizewell A site

Decommissioning progress

Berkeley develops 'Smoke Eater'

Berkeley

A project to size reduce cell boxes by thermally cutting them before packing into an ISO container has led to innovative techniques at Berkeley Nuclear Licensed Site (BNLS).

When cutting the cell boxes significant quantities of smoke containing highly contaminated particulates was generated.

A team was formed to design, test and commission a means of cutting that would capture the particulates, keep the operator out of the smoke, and allow easy clean-up of the cutting area. The team developed a fire resistant cutting chamber within an unused masonry room, built in a two tonne turntable mounted on wheels and added a secondary containment with sliding doors to allow forklift entry.

A high volume self-cleaning cartridge air filter known locally as "The Smoke Eater" was stationed outside the cutting chamber to deposit the bulk of the collected particulate into a 200 litre drum, dramatically reducing filter element waste.



In successfully delivering the project, the team met its design goal to size reduce and package a cell box in two days, and keep dose uptake as low as reasonably practical.

Dungeness CO₂ tanks



Dungeness A

At Dungeness A the main and diverse CO₂ tanks became redundant at the end of generation and a project team was set-up to look into the best disposal route. Instead of cutting the tanks up and scrapping them, the commercial team found a buyer for potential reuse – a safer and more environmentally-friendly alternative with £10,000 raised from the sale.

Now aboard ship, the tanks are providing a valuable service to the oil exploration industry. This true team effort delivered a safe and environmentally-friendly solution to redundant plant.

Berkeley achieves UK delicensing first

Berkeley

Berkeley Nuclear Licensed Site (BNLS) achieved a major milestone in the site's decommissioning plans by successfully achieving partial delicensing of the site in December 2006.

The area of the site that was released from controls was the largest in the UK to be removed from nuclear regulation to date. Eleven hectares of the site, where the Low Level Active Facilities and Central Radiochemistry Laboratories once stood, were delicensed. The 27 hectare site at Berkeley is now divided into two by a perimeter fence which encloses the remaining 16 hectares that are governed by Nuclear Licence.

...350 tonnes of scrap metal was recovered for recycling...



10 years early for pipe bridge removal

Hinkley Point A

Work to remove the pipes and bridges linking Hinkley Point A's reactor buildings to the turbine hall has been undertaken, ten years ahead of schedule. The project was originally planned for 2018 as part of the turbine hall deplant. However, due to the degradation of the plant, the task was moved forward and 350 tonnes of scrap metal was recovered for recycling.

Decommissioning progress continued...

Hinkley skips through a recycling milestone

Hinkley Point A

In October 2007, the first shipment of contaminated metal skips from the fuel cooling ponds at Hinkley Point A decommissioning site was sent to a recycling plant in the US.

After reaching the US, the skips are melted and the steel recycled for beneficial reuse only within the nuclear industry. This process saves the disposal of the skips to the Low Level Waste Repository near Drigg in Cumbria.

The recycling of the skips is critical to Hinkley's decommissioning and clean-up programme and driving hazard reduction on the former cooling ponds, a key objective for the NDA.

Although skip handling and size reduction has now been on-going for quite some time at Hinkley, a significant milestone was also recently achieved when the pond skip decontamination team processed the site's 500th skip for disposal.



Berkeley ILW Store given the green light!

Berkeley



Berkeley Nuclear Licensed Site was officially given the green light by Gloucestershire County Council to construct an Intermediate Level Waste (ILW) Store.

The plan would see the store constructed at the North East end of the site and will be used to house the site's ILW, with the exception of waste currently safe-stored within the reactors.

Transformers removed five years early

Bradwell

Bradwell has taken advantage of a buoyant scrap metal market to accelerate the removal of 14 transformers. The work, carried out five years ahead of the baseline schedule, has led to efficiency savings of £858,000. Removal of the associated oil has also reduced hazard on site and useful laydown space has been created for other projects.



Sizewell steps-up self performance

Sizewell A

Shift operations staff have continued their innovative approach to work since the cessation of generation, stripping redundant buildings and cutting up a spare gas circulator bowl in order to prepare the site for larger decommissioning projects.

The site's oxygen store and hydrogen store have become laydown areas, while deplanting the boron dust store has made the building available for use as a fabrication workshop. Clearing of the hydrogen compound involved heavy lifting of bulk hydrogen and methanol containers. Not only has it cleared over 600m² for future use, it has resulted in efficiency savings through the income generated from selling the items on as scrap.

This is an excellent example of retraining staff and utilising existing resource to self perform hazard reduction activities.



Bradwell reduces oil soak drums to save £75,000

Bradwell

Bradwell's waste management team completed a project processing legacy oil soak drums that had been stored inside ISO containers in the Reactor Controlled Area.

The process involved removing the drums from the storage location, carrying out integrity inspections, and processing the drums.

Through the process, the waste team reduced the original 290 drums to 140 after adopting more efficient processing and segregation techniques. As a result, approximately £75,000 of savings was passed on to the NDA.



Berkeley defines reduced Radiological Controlled Areas

Berkeley

The size of the Berkeley Site Radiological Controlled Area (RCA) has been reduced significantly to around a quarter of its original size as part of the ongoing decommissioning strategy and in preparation for future decommissioning projects.

This is a major achievement for the site and a first for Magnox South. The reduction was achieved by effectively dividing up the old RCA into smaller island RCA areas centred on particular buildings and areas where RCA conditions are still required.

The reduction in the RCA means the site is meeting its obligations under the Ionising Radiations Regulations 1999, by reducing controlled area conditions to that required for the practices taking place within them as far as is reasonably practicable.



...more than 100Te of metal was dispatched from Dungeness A for recycling...

Alchemy at Dungeness A

Dungeness A

In financial year 2007/08 more than 100Te of metal was dispatched from Dungeness A for recycling. All of the waste metal came from the plant and consisted of large items such as turbine steam cross-over pipes and large cooling water butterfly valves.

Planning of the project was carried out by Waste Management staff with good support from the Commercial department and EHS&Q. The project was completed in three days as scheduled and realised several thousand pounds from the resale value of the scrap.

Cooling water pumphouse progress

Sizewell A

Sizewell A has installed 320 metres of pipeline to serve as a new Active Effluent Discharge Line. Despite heavy rain which caused problems, the installation has been completed on schedule. This allows the site to move into the next phase of the project, which will see the line extended to the site's outfall structure. Once complete, the site will be able to discharge active effluent to the sea without the need to run the cooling water pumphouse, making the plant available for decommissioning. When the site was operational, the pumphouse played a vital role, supplying the turbines with a constant flow of water which was condensed into steam to generate power.



The clearance of the Hinkley Point A Cooling Water Pumphouse

Hinkley Point A

Around 400 tonnes of equipment was removed from the pumphouse at Hinkley Point A when it was deplanted in early 2007. The stainless steel, bronze, brass and cast iron material was removed from the site and recycled. The project was completed three months ahead of schedule despite challenging working conditions.

Bradwell

Bradwell completed the deplant and demolition of its pumphouse ahead of schedule in March 2007. All of the pumps were individually deplanted and removed from the site to be recycled, providing a visible sign of decommissioning to local stakeholders.



...the accelerated demolition of the Bradwell Cooling Water Pumphouse...

Decommissioning progress continued...

Impressive results from Hinkley Point A

Hinkley Point A

Deplanting the turbine hall at Hinkley Point A resulted in around 11,000 tonnes of scrap metal being recycled – and a whole list of impressive facts and figures:

- 61,080 kg of MMF and 328,480 kg of asbestos taken away in more than 100 skips for disposal at approved sites.
- more than 257 miles of scaffolding weighing 614 tonnes and held together by 42,000 fittings was needed.
- hundreds of gallons of oil were safely drained from the huge systems, put in barrels and disposed of at approved sites.
- 30 tonnes of copper cable ends recovered and recycled.

The project was completed on time and to budget with the empty 11,718m² hall due to be demolished later in the site's decommissioning programme.

Around 3,500 square feet of the building was quickly converted into a deplanting mock-up simulator replicating common engineering spaces that will need to be deactivated and deplanted as part of the decommissioning process.

Since April 2005 a number of buildings on the site totalling 3,671m² have been demolished.

The deplanted turbine hall



Completion of asbestos removal

Bradwell

Over 2,200 tonnes of asbestos has been removed from the Bradwell Site boiler houses, filling over 200,000 bags. Asbestos was the highest hazard remaining at the site, making its safe completion a major hazard reduction success.



During the process, each bag was handled four times – meaning there has been a total of 8,800 tonnes of asbestos manually handled without any incidents or accidents. It has taken the contractor, Forest Environmental Ltd, in excess of 280,000 hours to complete the project which was valued at £3.96m and completed for £3.32m – saving £640,000 against the initial plan.

Bradwell disconnects from National Grid

Bradwell

At 11.11am on 1 May 2007, significant decommissioning success was achieved with the permanent disconnection of Bradwell from the National Grid. After 47 years in service, Rayleigh Local 2 132kv feed was isolated, marking the end of its successful connection.



Reaching this point was the culmination of over two years of work. A new site electrical overlay system was installed and connected to a local area board 11kv connection, allowing the site to import electricity in the same way as other homes and businesses. In order to meet Bradwell's electricity requirements, EDF Energy was required to upgrade their local network with the installation of new cabling and upgrade of switchgear at the Maldon and Tillingham substations.

Hinkley orphan waste saves in excess of £1m

Hinkley Point A

A programme to retrieve and process orphan waste at Hinkley Point A has established the basis for annual efficiency savings across all pond projects. Redundant equipment from the cooling pond was retrieved, characterised, processed and size reduced. Equipment contained within drums and steel boxes elsewhere on the site was also processed and then repackaged.

Over 110m³ of Intermediate Level Waste was reduced to 20m³, reducing the amount of waste that will need to be housed in an ILW store. In addition, new contamination and radiation control processes were implemented which resulted in dramatic dose savings for site workers. Changes in Personal Protective Equipment used by project staff cut the amount of Low Level Waste generated by 8m³.

Managing the waste more efficiently led to recognised savings of £927,000 in 2006/07, with that figure expected to have increased to over £1.87m in the last year.



Dissolution sets the standard



Dungeness A's Magnox Dissolution (MXD) Plant is a unique success story that has set the standard for other Magnox sites needing to treat Fuel Element Debris (FED).

Since 1999, over 65 tonnes of radioactive Intermediate Level Waste has been processed through the dissolution plant so that the radioactivity it contains is isolated within a non-dissolved residual that comprises less than 5% of the original volume. The non-radioactive remainder is dissolved and released to the sea with negligible environmental impact from the effluent waste.

Dissolution of FED gives a huge volume reduction, dramatically reducing the number of resultant waste boxes that need to be stored and eventually disposed of in a national repository. The concept has been so successful that project teams at both Bradwell and Sizewell have been exploring the possibility of introducing the technology at the two sites.

Both have Fuel Element Debris that could benefit from the volume reducing process. Stakeholders at the two sites have been engaged throughout 2007/08, attending a range of workshops, providing useful challenges and contributing to the optioneering process.

At Sizewell A, the Environment Agency have commended the process for setting a new benchmark in nuclear sector stakeholder engagement, involving a truly representative range of community groups to survey the options and take part in the process.

eBay offers ideal solution

Hinkley Point A

Hinkley Point A came up with the ideal solution to remove submerged radioactive waste from part of the ponds complex – a second hand mini-digger purchased from eBay.

Staff modified it and converted it into a remotely operated vehicle (ROV) that in 18 working days recovered nine skips of radioactive waste and debris from Reactor 1 transit bay.

To carry out the recovery work manually would have taken around nine months and as well as the significant time and cost savings, the use of the ROV resulted in significant dose savings to workers.

The mini-digger, which was fitted with lights and a camera as part of the project, has now been safely stored awaiting its next project at Hinkley Point – or on other sites.



Modified second hand mini-digger.

...in 18 working days the digger recovered nine skips of radioactive waste and debris...

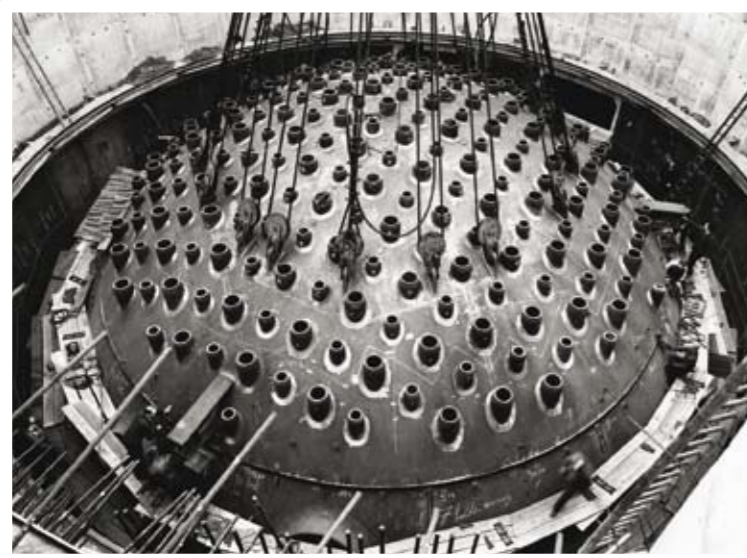


TWh & cessation of generation

Two world-class icons of the nuclear industry quietly bowed out of generation on New Year's Eve 2006, safe in the knowledge of a job well done. Dungeness A and Sizewell A between them boast 80 years of safe generation and were pioneers in commercial electricity production using nuclear fuel. During their lifetimes they produced more than two billion units of electricity – worth in excess of £10 billion at today's prices.



Plant items travelling to Sizewell during construction



The Dungeness Pilecap during construction

The focus over the next few years will be to safely remove all the fuel from the reactors and return to Sellafield for reprocessing as part of the two sites' decommissioning process.

11.524 TWh

From April 2005 until the cessation of generation, Dungeness A and Sizewell A safely generated 11.524 TWh of electricity



Our People

We are committed to the development of our staff, who are taking a lead role in the delivery of our decommissioning strategy. With all of our sites now in the defuelling and decommissioning phases, the challenge is to retrain and reskill much of the former operations workforce to perform decommissioning roles. We need to mobilise staff to deliver safe, innovative and efficient decommissioning across our sites.



Ian Liddell-Grainger MP opens the Decommissioning Skills Centre



Ken Powers launches the Deplant Mockup Simulator

“The Decommissioning Skills Centre is an excellent example of industry and education working together”

Ian Liddell-Grainger, Member of Parliament for Bridgwater

Flexible and innovative working

Unanimous support from the recognised Trade Unions for a new Employee Agreement led to its introduction in 2007. The new terms and conditions set out a framework for flexible and innovative working.

We are making use of the skills and talent within our business to create a mobile workforce, capable of achieving safe and innovative delivery at all of our sites. In 2007/08, this got under way with 35 staff undertaking a secondment of three months or more away from their base location. At Bradwell, staff from Dungeness A supported the delivery of the Circulator Hall deplant, where more than 143 tonnes of metal has been sent for recycling – generating over £14,000 income. Meanwhile, Sizewell volunteers travelled to Hinkley Point A, where they joined the effort to remove and dismantle the tonging crane. This had originally been used to handle and transfer fuel elements from the pond skips and load them into the desplitting machine.

Retraining and reskilling

Self performance of decommissioning activities has become a major focus for Magnox South. The ability to retrain and reskill the existing workforce to undertake Decontamination and Deplant (D&D) projects enables significant efficiency savings to be achieved and offers greater career opportunities for our staff.

To support this, a Decommissioning Skills Centre has been created in partnership with Bridgwater College at their Cannington campus, near Hinkley Point A Site in Somerset. A series of courses have been formulated, with 92 staff completing a D&D technician programme and 19 gaining an NVQ Level 2 in Nuclear Decommissioning.

A full scale replica of the common engineering spaces that will be deactivated and deplanted during decommissioning has been built. The Deplant Mockup Simulator, which is 3,500 square feet, stands in the deplanted Turbine Hall at Hinkley Point A where it will act as the cornerstone to our worker reskilling programme.

Twelve centrally developed courses were reviewed and updated in 2007/08. In total, there were 5,856 training days for Magnox South staff during the year.

National Skills Academy for Nuclear

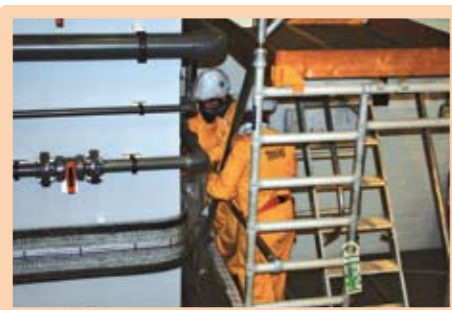
Magnox South took a leading role in the creation of the National Skills Academy for Nuclear, working closely with other nuclear employers and Cogent, the employer-led skills development body delivering UK wide strategic solutions to the energy industry. The Academy will assist employers to tackle current and future skills barriers and challenges that face the industry.



David Bonser, Chair of the National Skills Academy for Nuclear board presents Philip Parker, Magnox South HR Director, with a certificate to recognise our Associate Membership of the Academy

Common access pilot

Magnox South has undertaken an industry first pilot, with the introduction of common unescorted access training. Successful completion will allow trained staff to access our five sites without the need for repeat training. This will significantly reduce the cost of inductions and will support the mobile workforce initiative.



The Deplant Mockup Simulator at Hinkley

Developing new talent

We continue to recognise the importance of developing new talent within the industry. We currently have 47 graduates undergoing a graduate professional programme, ten of which joined this year. The scheme is accredited by the Institute of Mechanical Engineers, Institution of Chemical Engineers, Institute of Physics, Royal Society of Chemistry, Institution of Engineering and Technology and the Institution of Chemical Engineers.

We also have three apprentices, including Chloe Bridges at Hinkley Point A. Chloe was awarded second place in the Engineering Employers Federation Apprentice of the Year competition for Somerset – beating more than 100 other entrants.



Socio-economic development

Four community projects in the south-east received development grants through Magnox South worth over £127,000; donations which support the NDA in meeting its socio-economic obligations, set out by government in the Energy Act 2004.

Each year since its inception, our five sites have produced separate Socio-Economic Plans to back the NDA in its effort to create dynamic, sustainable local economies for communities living nearby.

Experience has proven that this approach can lead to unwanted inconsistency in the way support is offered across the patch, and Magnox South responded to this in the final weeks of 2007, opting instead for a consolidated strategy.

An awareness campaign was targeted at key stakeholders such as Regional Development Agencies, County and District Economic Development Teams, some educational institutions, and community regeneration groups.



Supporting local education career days to promote the nuclear decommissioning industry



Berkeley Site Director Jim Crocker and local MP David Drew host a community evening for local stakeholders

Bids for social economic support

Despite short response times, 20 formal bids totalling £671,000 were received before the deadline. And a process of ranking, which utilised tried-and-tested scoring methods, was used to reach the funding decisions.

Those successful were:

- St Peter's High School (Bradwell Site), £51,748 for computer-aided manufacture equipment as part of its bid to achieve specialist school status;
- Maldon District Council (Bradwell Site), £15,000 towards the cost of employing a Rural Business Advisor;
- University Centre Folkestone (Dungeness Site), £36,000, enabling it to provide a range of higher education taster courses in the Dungeness catchment area;
- Norfolk and Waveney Enterprise Services (Sizewell Site), £24,500 to fund a study assessing a proposal to redevelop a local business centre.
- Significant company funding enabled a redundant cheese factory at Bridgwater College's Cannington complex to be refurbished into a Decommissioning Skills Centre. The innovative project was described by local MP Ian Liddell-Grainger as: "an excellent example of industry and education working together".

- **PBO funding from EnergySolutions resulted in a cheque for £182,000 being given to Bridgwater College to support equipment costs for the introduction of a new Foundation Degree in Nuclear Decommissioning. Sites also received small amounts of PBO funding for local sponsorship and donations.**



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Printed on 9lives Offset Uncoated
Fibre: 100% post consumer reclaimed material.
Bleaching: Pulp is bleached using an Totally Chlorine Free (TCF) process.
Manufacturing accreditation: ISO 9001, ISO 1400
Product certification: FSC 100% recycled, NAPM recycled approved