

Magnitude

BRINGING YOU NEWS FROM ACROSS MAGNOX



The Magnox story

Neil's notes



“Welcome to this special edition of Magnitude, which you will see is something of a reflection on the journey we have travelled together since 2005. Back then, our challenge was to progressively turn a successful operating company into an equally successful decommissioning one. We had nuclear fuel on six sites, generation was due to end in 2010 and legacy waste still had to be tackled.

But how the landscape has been transformed since that time. Extended generation at Wylfa and Oldbury has produced an additional £1 billion of income for our customer, the Nuclear Decommissioning Authority, and soon we will have only two sites left with fuel.

Through the Magnox Optimised Decommissioning Programme and our programme approach we have emptied ponds, demolished turbine halls, blown down cooling towers, got to grips with fuel element debris, removed huge amounts of asbestos and have gone further than many thought possible in dealing with the intermediate level waste legacy.

We have significantly reduced hazard and removed 34 site years from the programme, saving the taxpayer £1.8 billion.

We've had strong leadership across the company, no small measure of innovation, a determination to succeed and, most importantly, we've looked after each other. On this note I take great pride, and you should too, that in 2014 Magnox Ltd has been awarded the Sir George Earle Trophy by the Royal Society for the Prevention of Accidents. This is the foremost safety award in the UK and a fantastic accolade for us all.

So, as we prepare to hand over the baton to the new owners, you should reflect on what's been achieved and get ready to meet new challenges with your usual professionalism and enthusiasm. But, most importantly,

Keep looking after one another.

Neil

Neil Baldwin
Managing Director

TIMELINE

APRIL
Site Stakeholder Groups with independent chairs established

2005
Six Magnox sites had fuel four had been defuelled

2006
Bradwell declared fuel free

APRIL
14.6 TWh of electricity generated across the Magnox sites during 2005/06

2006
Chapelcross ponds empty of fuel

A story of improvement

Magnox is proud of its environment, health and safety record.

A series of Royal Society for the Prevention of Accidents (RoSPA) sector awards recognise the impressive performance of the company over a decade, improving year on year.

Nuclear safety remains the highest priority for Wylfa and the other sites that still have spent fuel. Wylfa is the oldest commercial nuclear power station in the world, but its operating performance compares with the best of the UK's newer nuclear power stations.

All employee radiation doses are kept as low as reasonably practicable (ALARP) with average employee and contractor doses being kept well within safe and legal dose limits. The attention given to the

management of waste and environmental risks has increased significantly. Wylfa and Oldbury have been awarded five star environmental ratings by the British Safety Council and Bradwell was recognised as recycler of the year in the construction industry awards in 2011.

As the focus of our business has shifted, conventional safety has become even more of a priority. Even though we strive for zero accidents, we are proud that in 2013/14 Magnox staff worked over 11 million hours with only one accident which resulted in just 20 lost hours.

Magnox continues learning from experience, looking for best practice and continued improvement.

Datafile

Since 2005 Magnox has achieved:

12 RoSPA Gold Awards

37 RoSPA Gold Medals

36 RoSPA Presidents Awards

18 RoSPA Orders of Distinction

RoSPA Sector Awards in 2006, 2007, 2008, 2012, 2013 and 2014

The British Safety Council Sword of Honour in 2008, 2009, 2011 and 2012

The British Safety Council Globe of Honour in 2012

RoSPA Sir George Earle Trophy 2014

APRIL 2005

NDA

Nuclear Decommissioning Authority

Formation of Nuclear Decommissioning Authority

The Nuclear Decommissioning Authority (NDA) was formed by the Energy Act 2004, with the purpose of delivering the decommissioning and clean-up of the UK's civil nuclear legacy in a safe, secure and cost-effective manner. Today, the NDA's overall annual budget is around £3.2 billion.

DECEMBER 2006



Berkeley delicensing milestone

11 hectares of land at Berkeley, approximately a third of the original site, was delicensed.

DECEMBER 2006



Shutdown at Dungeness and Sizewell



By Haf Morris,
Communications Officer

“New Year's Eve 2006 was a celebration out of the ordinary, marking the end of generation at both Dungeness and Sizewell.

“While the final closure was the culmination of a total 80 years of safe and successful electricity generation for both sites, for me and my communications colleagues at Dungeness and Sizewell, the day represented months of planning. I was at Dungeness early in the morning making final arrangements for the arrival of media teams, including the BBC and ITV.

“The shift teams, lucky enough to be on duty in the final hours, undertook their work with pride as reactor one was safely brought offline in the late morning to applause from the watching onlookers.

“We then embarked on a series of interviews as Site Director, Nick Gore, spoke to the media. I even made my international television debut on BBC World News. It was before most things were published on YouTube so I've never been able to see it!

“It was a more low key affair in the evening, although a few staff from other shifts and one or two visitors had popped in to see the end of an era. As reactor two was brought offline in the evening we all headed home and made it to our families before raising a glass to the start of 2007, knowing we'd all return to a very different workplace where nothing would quite be the same again.”

2007
Magnox supports skills centre at Bridgwater College

APRIL
New company agreement signed

JANUARY
Oldbury power station is 40 years old

SEPTEMBER
EDF finalises the deal to buy British Energy

2008
Magnox lifts RoSPA Engineering Construction Sector Award



JUNE
BNFL sells Reactor Sites Management Company to EnergySolutions

APRIL
Great Bustard spotted at Oldbury

MAY 2007



Chapelcross cooling towers demolition



By Dave Wilson, Chief Operating Officer

“At 9am on a crisp Sunday morning in May the skyline around Chapelcross changed forever.”

“The demolition of the landmark Chapelcross cooling towers cost £3 million and took three years of meticulous planning and extensive stakeholder consultation and it was all over in twelve seconds.”

“Thousands of people witnessed the historic event from safe vantage points across the region as, one by one, each of the 300 foot iconic cooling towers were successfully and safely demolished in the first controlled explosive demolition of this scale at a UK nuclear site.”

“Thousands more around the world watched the demolition live on the web. Robbie Coltrane, aka Hagrid in the Harry Potter films, was a mile from the site at Creca filming a documentary on the cooling towers as the finale to his three part series, B-road Britain.”

“I remember at the time saying to the local and national media that it was the end of an era and it was sad to see them go.”

Oldbury reactor returns

Oldbury reactor two returned to service after a two-year outage. The reactor had been shutdown in June 2005 for its normal biennial outage but did not return to service until May 2007.



AUGUST 2008



First fuel element removed at Chapelcross

The first of 38,075 fuel elements at Chapelcross was safely removed from reactor one on 18 August. To allow this to happen, a £30 million project was required to design, manufacture, install and commission a new defuelling route at the site.

NOVEMBER 2008



Hinkley ponds ROV



By Rob Taylor, Programme Delivery Manager

“The remotely operated vehicle (ROV) is a machine which was modified at Hinkley for use underwater in the ponds. It was based on a modified second hand excavator which was used to clear debris and sludge from the reactor one D-bay. The ROV was originally intended to work underwater for 16 days. In the end it was deployed for 323 days and assisted in the ponds clean up at Hinkley and later Bradwell.”

of kit developed by Magnox. Bob Bond and Geoff Pitman were instrumental in the design and build and without them the Hinkley ponds would almost certainly not be as far down the decommissioning line as they are.

“We first deployed the ROV in November 2007 and in 18 days the team achieved what would have taken around nine months of manual effort. We significantly reduced worker dose uptake and the cost saving was significant – about £85,000 for the Hinkley clean-up alone.”

“After the success of the ROV, Geoff and Bob went on to build two micro diggers, one went into service at Hunterston and the other has recently been handed over as an asset transfer to Sellafield and is intended to be used on the ponds clean-up programme there.”

Strip down complete

In 2007 the deplanting of the turbine hall was completed at Hinkley.

Over 11,000 tonnes of scrap metal and 389 tonnes of asbestos and manmade mineral fibre was removed in the process which took over four years.

This was the first major decommissioning activity to take place on the site.



SEPTEMBER 2007

i4 Innovation: Inspire, Imagine, Innovate, Implement

Magnox launched an initiative to encourage and reward innovation. Since the competition began, more than 2,000 ideas have been considered.



CO₂ tanks leave Dungeness

Four redundant CO₂ tanks left Dungeness for a life on the ocean waves. On board the ship they now store acid used in the North Sea oil field.



DECEMBER 2008



ILW stream complete

One of the first intermediate level waste (ILW) streams to be fully recovered and packaged at any nuclear site in the UK was achieved two months ahead of schedule at Trawsfynydd site. The stream was miscellaneous activated components and consists of activated components which were removed from the reactor core during the operational life of the station.



2009
The NDA awards £2.5 million to support a Chapelcross business park and incubation units

NOVEMBER
Horizon Nuclear Power established to develop new nuclear power stations at Oldbury and Wylfa

2010
Hinkley decontaminates the last of 1,800 skips

MARCH
NDA Sells land to support new nuclear build

JUNE
Launch of Anglesey's 'Energy Island' initiative

AUGUST
Completion of construction of internal capping roofs inside both Trawsfynydd's reactor buildings

2010
Wylfa gets permission to generate past 2010

2009



Dungeness goes yellow with first waste package

Dungeness became the first site in the UK to fill a ductile cast iron container with intermediate level waste (ILW). Mike Gull, then ILW Programme Director, looks back.



By Mike Gull, Bradwell Site Director

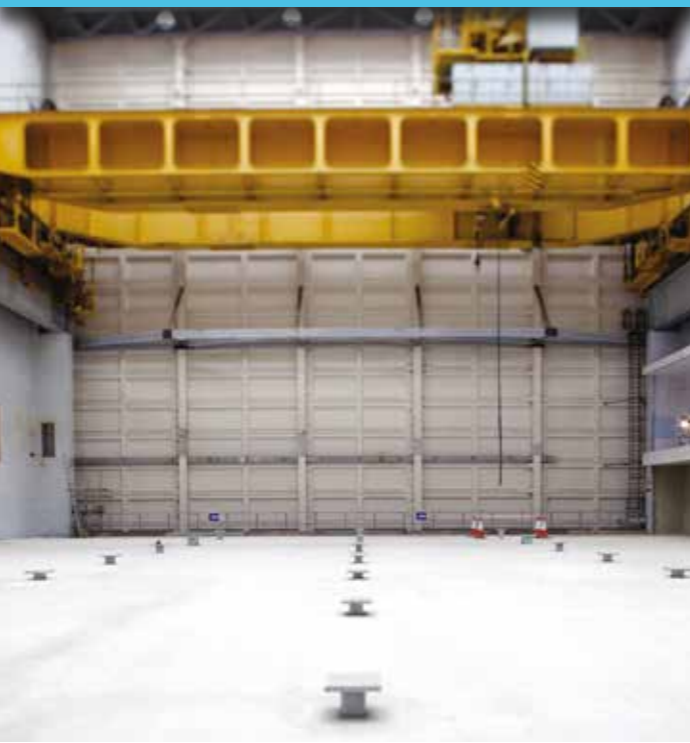
“Faced with a funding challenge and a desire to push on with hazard reduction, we were looking for a more flexible and cost effective solution to manage ILW. The concept sounded simple. The container provides package integrity rather than the store, enabling a buy as you go approach where boxes could be purchased and filled before a building was constructed.

“Making that a reality was a huge challenge and probably remains the single biggest technology change we’ve

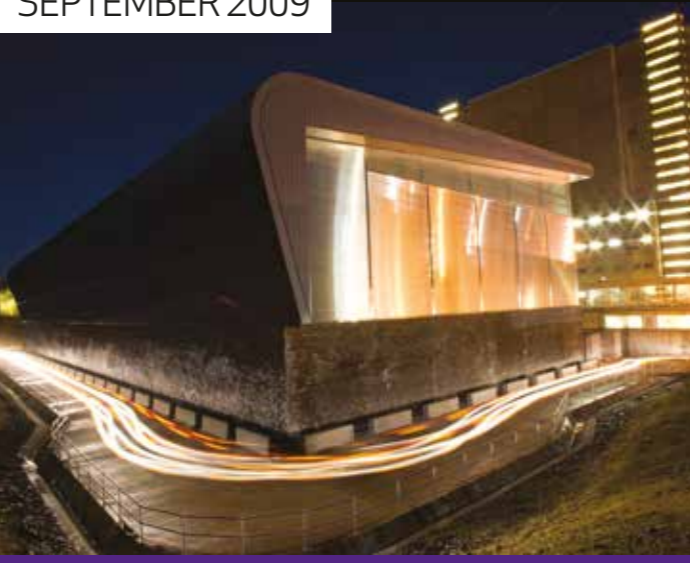
made to the decommissioning programme.

“An early demonstration that the boxes would work was essential. Dungeness was the ideal site because of an operational need to store resin and this allowed us to prove the capability of the box in a safe and reversible way. Those three boxes are still safely in place today.

“There are still challenges ahead, but we have two interim storage facilities holding conditioned ILW and I am very proud of that progress. Many people have played a part but we shouldn't forget the role of the supply chain, in particular GNS who supply yellow boxes, the regulators and Radioactive Waste Management Ltd who assessed our proposals and of course the Magnox team that has fundamentally changed the landscape of ILW management in the UK.”



SEPTEMBER 2009



Trawsfynydd ILW store opens

The intermediate level waste store at Trawsfynydd was the first in the UK to become operational, receiving the first of around 3,000 packages for storage on 9 September.

OCTOBER 2010

Powering on



By Joe Lamonby, COO, Fuelled Sites.

“Both Oldbury and Wylfa have extended their generating lives. This involved a huge amount of work by the sites and the

support team to demonstrate the safety of future operations.

“Oldbury finally shut in 2012 and Wylfa reactor one is still (2014) operating safely following approval to transfer fuel from the shut-down reactor two. Wylfa is aiming to generate from reactor one until December 2015. By making best use of the remaining nuclear fuel, Magnox has generated at least an additional £1billion - a significant contribution to the costs of decommissioning.”

Last drums of MDU shipped from Chapelcross

More than 10,000 drums of Magnox depleted uranium (MDU), carefully over packed in stainless steel containers, were shipped to Capenhurst from Chapelcross.



DECEMBER 2010



Berkeley safestores

December 2010 marked the end of the two-year Berkeley 'safestore' project that was delivered by a team led by Paul Oswald.



“In short, Berkeley sealed up its two reactors, placing them into a passive state known as 'safestore' only periodically entered for monitoring and maintenance, until final site clearance.”

Paul recalls how the project grew in significance becoming a hugely influential piece of work. Berkeley's 'safestore' project earned itself a triple first – a first for Magnox, a first for the Nuclear Decommissioning Authority and a first for the UK nuclear industry.

“The safestores brought about a shift in perception. After the doors had been sealed, people accepted that they were no longer able to go into the buildings and it would



be two years later before the safestores would be reopened for a routine check.”

Paul was responsible for driving forward one of the most significant projects in UK nuclear history and looks back with a huge sense of pride on his role in the achievement.

2011
Hinkley turbine hall backfilled with EDF Energy spoil



NOVEMBER
Bradwell demolishes turbine hall

2011
Last delivery of Magnox fuel to Wylfa

APRIL
Start of Magnox RSRL competition process
Magnox socio-economic scheme launched

AUGUST
Wylfa begins inter-reactor transfer of fuel

SEPTEMBER
Magnox wins Constructing Excellence East of England award



2011
Magnox transition agreement signed

APRIL
Launch of Magnox Limited

JUNE
Oldbury reactor two ends generation

NOVEMBER
Magnox Plant and Structures Programme awards £304 million framework contract

APRIL
Wylfa's reactor two ends generation

APRIL
Final fuel flask leaves Dungeness

JULY
Record rainfall means extra generation for Maentwrog

AUGUST
Magnox achieves Investors in People Gold and wins Personnel Today award

FEBRUARY
Chapelcross drains and seals its first pond



AUGUST
Phase one of Europe's largest asbestos removal project complete at Chapelcross



MAY
Neil Baldwin becomes chair of National Skills Academy for Nuclear
Nuclear Decommissioning Authority award £1.2 million to Beyond Chapelcross

DECEMBER
The Snowdonia Enterprise Zone Trawsfynydd is launched

NOVEMBER
Dungeness receives £12.8 million from the NDA to help speed up decommissioning and demolition work

MARCH 2011

Magnox response to the accident at Fukushima Dai-ichi

On 11 March 2011, Japan suffered its worst recorded earthquake. The following tsunami caused a serious nuclear accident at the Fukushima Dai-ichi nuclear power site.

Magnox has addressed the recommendations made by HM Chief Inspector of Nuclear Installations, which mitigate the impact of extreme events that are outside the sites' safety cases.

Magnox Optimised Decommissioning Programme



By John Vlietstra, Chief Operating Officer

In 2009, Magnox was asked to undertake a programme review called Safe and Secure Sites by the Nuclear Decommissioning Authority (NDA).

"My team and I were asked to understand what would be required to put the sites into a condition where they could be left so funding could be channelled towards higher hazard reduction across the NDA estate.

"The result in 2011 was a whole new work programme that, far from stopping work, accelerated clean-up and hazard reduction significantly, at a reduced cost and provided

opportunities for staff and the supply chain.

"We called the approach Taking Magnox Forward and looked at every area of delivery and innovation. From extending generation at Oldbury and Wylfa, to optimising defuelling arrangements and organising decommissioning into a series of consistent work programmes - we built a collective plan for the Magnox estate.

"The resulting Magnox Optimised Decommissioning Programme was implemented, requiring hundreds of change control procedures. It saved £1.3 billion, a figure which later increased, from the existing plan and removed 34 site years from the time expected to get the sites into care and maintenance.

"It was a massive team effort that touched almost everyone in the business and it marked a real turning point as we set about transitioning Magnox into a world class decommissioning organisation."

JUNE 2012

Demolition of seven buildings

Dungeness completed its first phase of demolition work, taking down seven buildings, including the old administration block, its adjoining annex and disused canteen.



FEBRUARY 2012

Oldbury ends generation

After 44 years of safe operation, Oldbury power station - then the world's oldest operating nuclear power station - ceased generation at 11am on 29 February 2012.

Andy Freeman and Simon Priday, who were part of 'E' shift responsible for shutting down the reactor, reflect on what happened.

"I remember the day being relentless," said Andy. "We are trained in shutting down a reactor, but there were a lot of visitors to the control room that day and to add to the pressure several cameras were recording what happened.

"I remember having to pretend to do the shut down several times so the cameras could record it, and I was interviewed too - there was a lot of focus on the 'reactor trip button' but there was much more to it than that.

"Some people had been on site their entire working lives so it was quite an emotional day for them.

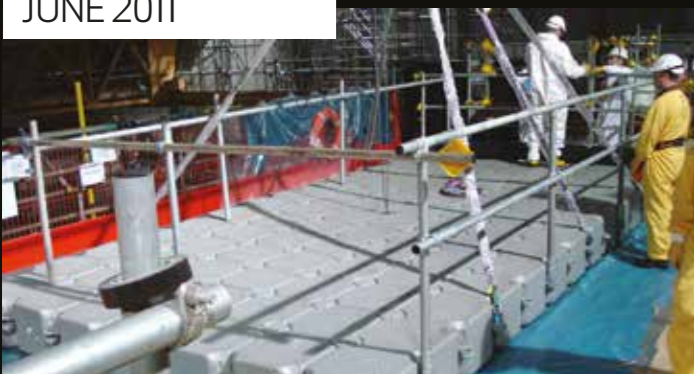
"We had a lot to do after the shut down happened," said Andy. "There are alarms to address, cooling to be established, safety rods to withdraw and logs to complete before handing over to the oncoming shift.



"Afterwards we went to the pub and then went home to watch ourselves on TV.

"The control room is very different now, we've had to get to know different systems and procedures, and the nature of the job has changed to deliver safe defuelling."

JUNE 2011



Walking on water

In June 2011, pioneering work began at Hunterston to allow safe access to the whole of the cooling pond using floating pontoons.



Creation of the Hub

The Hub was created in 2012 as a small, central team to manage sites when they enter the care and maintenance stage of their lifecycle.

2013
Community impact report funded to support care and maintenance preparations at Bradwell

APRIL
Magnox gets Engineering Construction Industry Training Board award

NOVEMBER
NDA hold largest nuclear supply chain event



JANUARY
Tate Britain make film featuring Trawsfynydd



MAY
Completion of abseiling work to repair and seal the precast concrete panels on the side of Trawsfynydd's reactor buildings



MAY
All bulk intermediate level waste resin removed from Trawsfynydd resin vault two

2013
Bradwell and Trawsfynydd decommissioning 50 per cent complete



NOVEMBER
Legacy tank at Trawsfynydd successfully decontaminated



FEBRUARY 2013

Chapelcross dispatches last flask of fuel
Chapelcross achieved a major milestone when the last flask of spent fuel left the site for reprocessing at Sellafield.



Berkeley boiler project



By Simon Bedford, Project Manager
"I was the lead Project Manager for the boiler removal project at Berkeley. It felt great to be involved in such skyline changing work. The boiler project was probably one of the most talked about projects that Magnox had ever undertaken."

"The project itself was extremely challenging. We were looking to move fifteen, 310 tonne boilers, through Berkeley town and to Sharpness docks. From the outset we worked closely with our supply chain partners, Low Level Waste Repository Ltd, Studsvik and Abnormal Load Engineering (ALE). Getting this relationship right was so important to us delivering the project to demanding timescales."

"I experienced working with a whole range of stakeholders, from regulators through to the police and members of the Site Stakeholder Group. We thought one of our biggest risks would be the lack of community support, but on the day of the first boiler moves large crowds of people gathered in Berkeley town and to Sharpness docks. "Finally, I learnt about how important communications is to successful project delivery. I believe our early engagement with the local community was essential and I spent a great deal of time making sure they understood the project before the first moves took place."

"All 15 boilers made it safely to Studsvik's specialist treatment facility in Sweden, with up to 95 per cent of each boiler being recycled back into the metal market."

MARCH 2013

Magnox signs staff transfer protocols



A number of agreements have been established between Magnox and various external organisations to provide staff with career opportunities outside of the company as it reduces numbers of employees.

FEBRUARY 2013

Bulking down

More than 2,100 tonnes of asbestos waste has been removed from Hinkley since it ceased generating electricity, and in 2013 the last bulk removal operations were completed and sent off site for disposal. The turbine hall alone had over 389 tonnes of asbestos removed, filling over 80 skips.



Hunterston land remediation

The catch pit seven (CP7) remediation project at Hunterston was completed, representing a major land remediation for Magnox. The area became contaminated in the 1970s when the original active effluent pipeline fractured.

MARCH 2013

Talking waste
Magnox led a review of the strategies for interim storage of intermediate level waste and the treatment of fuel element debris at its sites in England on behalf of the Nuclear Decommissioning Authority (NDA).

First ISF

The first interim storage facility (ISF) is built at Bradwell in 2013. It can store up to 170 ductile cast iron containers and has taken receipt of a package containing conditioned intermediate level waste.



Marsh Million



Magnox provides £500,000 of socio-economic support to the Marsh Million fund to encourage business growth on the Romney Marsh.

JANUARY

Magnox signs £200 million framework contract for self-shielded waste containers
Magnox graduates first to complete certificate of nuclear professionalism

JAN

FEB

MAR

APR

MAY

JUNE

JULY

AUG

SEPT

OCT

NOV

DEC

MARCH

NDA announces preferred bidder in Magnox RSRL competition

JULY

First fuel element debris processed at Bradwell

FEBRUARY 2014

APRIL 2014

Four boxes, four stores...

Dungeness south side site clearance



By Phil Sprague,
Intermediate Level Waste (ILW) Programme Director

are now retrieving, packaging, conditioning and storing waste across five sites, with Chapelcross and Dungeness about to start.

"I am immensely proud of the various teams across the patch and it was great to be recognised at the i4 awards, where work on the ILW programme won three of the five categories. This is a testament to the innovative work being done around the sites.

"Having ILW packed and stored at four sites was a great way to finish off last year and as we move into a period of significant change I know the programme will continue to make progress and deliver safely."

Demolition work at Dungeness stepped up a gear when the link bridges between the reactor buildings and the site's conventional plant were removed.

With the turbine hall and surrounding buildings isolated and the link bridges removed the area is ready for demolition.

"Getting to grips with legacy ILW has been a key part of the Magnox Optimised Decommissioning Programme. This year I can say we are now making exceptional progress and meeting Neil's challenge of breaking the back of ILW.

"Our achievements should not be underestimated; we

MARCH 2014

MAY 2014

Magnox celebrates after winning RoSPA accolade

Magnox celebrated after winning the Royal Society for the Prevention of Accidents (RoSPA) Sir George Earle Trophy – internationally recognised as the premier performance award for occupational health and safety.

David Rawlins, RoSPA's awards manager, said: "The RoSPA Awards encourage the raising of occupational health and safety standards across the board.

"Organisations that gain recognition for their health and safety management systems, such as Magnox Limited, contribute to a collective raising of the bar for other organisations to aspire to, and we offer them our congratulations."

The company took ten further awards, including the prestigious Engineering Construction Sector Award, at the 2014 RoSPA Awards.

Wylfa's final outage



"A lot of the tasks we completed were for the final time, such as boxing up the vessel and gassing up, as well as using remote inspection equipment that had served us well for the last 40 years.

"The site's final health check will enable us to go on to deliver the final period of generation. I am proud to say that I was involved in the last ever outage and am grateful for the effort made by everyone involved."

By Medwyn Williams,
Outage Manager

"It was something of an honour to be the outage manager for the last ever Magnox outage but it was also a huge responsibility.