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NDA
Nuclear
Decommissioning
Authority

INSIGHT

into nuclear decommissioning

Delivering progress across the UK

Contents

Front cover: A trainee at work in Coleg Menai's new Energy Centre

Welcome to the first 2012 edition of Insight, which provides a snapshot of some of the latest developments around our estate.

If you have any comments, please contact the editor Deborah Ward on 01925 802343 or **deborah.ward@nda.gov.uk**

Coleg Menai's new Energy Centre *see p20-21*

Interim Chief Executive named

The NDA's Chief Financial Officer David Batters has taken on the role of Accounting Officer and Acting Chief Executive until a new appointment is made following the departure of Tony Fountain.

David joined the NDA in 2010 and is a Chartered Management Accountant, who spent more than 20 years with BAE Systems in a variety of finance-focused roles.

Departing CEO Tony Fountain has returned to a career in the oil and gas industry after spending two years with the NDA.

Support for smaller businesses

The NDA and its SLCs, with support from the Tier 2 contractor community, are collaborating on a series of measures aimed at providing greater support to smaller businesses seeking opportunities in the decommissioning market.

Sean Balmer, NDA's Commercial Director at November's Meet the Buyer event in Bolton

Following workshop discussions with existing contractors, one of the initial steps was a first-ever joint event for existing and potential suppliers, held in Lancashire at the end of last year, which attracted 450 delegates. The event enabled Small and Medium Sized Enterprises (SMEs) from across the UK to engage with all the NDA Site Licence Companies and top Tier 2 contractors to discuss potential contract opportunities on a face-to-face-basis.

Feedback from delegates is being taken into account as the NDA and SLC team continue to work on practical initiatives which will include a single estate-wide e-portal advertising forthcoming contracts, a simplified generic pre-qualification questionnaire and simplification of the NDA's own flow-down conditions for sub-contractors. Working Groups with members from all tiers of the supply chain have been supporting and providing input to these initiatives.

The NDA's Strategy recognises the importance of a supply chain, with support needed in particular for SMEs. Meanwhile, the Government has also challenged public organisations to provide SMEs with wider access to their markets.

Lord Hutton of Furness, the former MP for Barrow and Furness, served the last Labour Government in a number of Cabinet roles including Defence Secretary and Business Secretary, a portfolio which covered energy security issues. Most recently, he became chair of the Nuclear Industry Association.

Year of opportunities in the nuclear sector

As we welcome in the New Year, I feel confident in predicting that 2012 will be the year for nuclear delivery and for new opportunities across the industry.

The Nuclear Industry Association is aligned with and fully supports the work of the NDA and its Site Licence Companies to develop opportunities for their supply chain.

The NDA's role in maintaining a robust supply chain is crucial not only to the successful delivery of its own remit, but also to the future wellbeing of the industry. The NDA already spends almost 60% of its budget - £1.37 billion last year - in the supply chain, helping to sustain the capability the sector needs now and into the future.

I cannot stress too highly how important it is to deal effectively with the legacy from the early pioneering days of nuclear technology. The policy, institutional and industrial measures are in place to achieve that.

Success in dealing with the legacy will help create the right environment for future new build and improve public confidence in the industry's ability to deliver a safe, secure, reliable nuclear programme to the benefit of the country's future energy needs, as well as to its economic wellbeing through boosting its industrial and skills base.

There are clear synergies between the various nuclear sectors. Many of the same companies who are active in existing operations and decommissioning will be involved in new build. It would be a mistake to compartmentalise those activities because understanding of the nuclear culture, the quality standards and the commitment to safe operations are common across the whole industry.

There will be new build opportunities at home and overseas, coupled with opportunities in decommissioning in which the UK leads the world by virtue of our pioneering nuclear technology from the 1950s onwards. These opportunities are generating substantial interest from companies already in or preparing to join the nuclear supply chain.

I strongly recommend the website **SC@nuclear** which was specifically designed to inform companies and help them prepare to compete successfully in the domestic and international markets.

This programme has the support of government, the major companies in the industry and the trade unions. Around 1,000 companies – many new to nuclear but with experience in other highly regulated and high-tech sectors - are registered with **SC@nuclear**.

They receive valuable information - through regular presentations, newsletters and publications - about the nuclear market, the structure of the supply chain, nuclear codes and standards and the quality arrangements they will need to demonstrate to potential clients.

The website also provides links to the procurement portals of those client companies who will be letting commercial contracts.

Lord Hutton of Furness

The UK industry is in a strong position to capitalise on our long history of nuclear achievements, and our reputation for quality and professionalism.

I believe that we can and will, with the support of industry partners, deliver a bright nuclear future for the UK, bringing not only secure, affordable low-carbon energy, but also substantial numbers of jobs and economic benefits.

spotlight on

Winfrith

Demolition work has just been completed on the Waste Encapsulation Treatment Plant

Expect the unexpected

Finally, the end is in sight for two facilities that deal with the radioactive sludge from Winfrith's most famous experiment, the Steam Generating Heavy Water Reactor, or SGHWR.

Four tall concrete tanks, more than four metres high, stored sludge generated during a 23-year operational life that ended when SGHWR closed in 1990. But before the External Active Sludge Tanks (EAST) could be decommissioned and taken apart, their contents needed to be retrieved and stabilised in grout mix. This led to construction of the £12 million Waste Encapsulation Treatment Plant (WETP) by contractor Nuvia, which opened in 2005 and completed its mission last year after producing 1,068 stainless steel drums which will be stored on-site pending a final disposal solution.

WETP was demolished at the end of last year (2011) and EAST is on schedule to follow suit by March 2012, marking a major milestone in the site's restoration.

Over the years, the project has thrown up some unexpected obstacles for the team from Research Sites Restoration Ltd (RSRL), which were solved with a combination of ingenuity and innovation.

RSRL project manager, Cliff Strange, said: "All went reasonably smoothly until we reached the final stages, when we discovered a quantity of dense material in the bottom of the tanks. It was mostly silica and generally referred to as 'sandy material'. The recovery of this unexpected material required different methods and a fair bit of innovation."

Nuvia, in conjunction with RSRL, developed a process to recover the sandy material using an industrial vacuum-pumping system – called Big Brute – and encapsulate it in 40-litre containers, within prepared 200-litre waste drums. The sandy material was recovered in 20kg batches and mixed with a premixed grout in a temporary encapsulation rig, also developed by Nuvia.

With the tanks – whose walls were more than half a metre thick - now empty, work could begin on decontamination, dismantling and cutting up the concrete. This work is now nearing completion with three-quarters of the tank structure removed.

In November 2010, an engineer entered one of the tanks to carry out a radiological survey, the first time anyone had been inside for 40 years. Considerable progress has since been made on removing the tank roofs and walls, using innovative diamond wire-cutting techniques.

Most of the concrete arising from dismantling the tanks will be disposed of either as Very Low Level Waste (VLLW) or exempt material.

Dismantling has also thrown up challenges, with investigations required to establish the source of a suspected 'hot spot' in the pipe corridor.

Cliff said: "Though this 'hot spot' is only the size of a little fingernail, the exacting standards to which we operate mean it must be fully looked into and properly dealt with."

The final piece of the jigsaw was the demolition of WETP, with the entire project due for completion by March 2012.

Winfrith over the years

The iconic SGHWR produced enough power for a small town

The Queen was welcomed to the pioneering centre in 1969

It was 40 years before workers were able to access the concrete External Active Sludge Tanks

Demolition work under way at the Waste Encapsulation Treatment Plant

Winfrith before the research site was fully developed

Unique place in UK's nuclear history

The remote heathland of Winfrith in Dorset was the second site chosen by the Government to carry out research on experimental reactors in the post-war years.

Harwell, in Oxfordshire, had been the first site selected to help pioneer the UK's drive to harness nuclear fission for electricity generation.

Back in 1957, Winfrith had good road and rail connections to London, as well as a large supply of essential fresh cooling water and potential workers from Bournemouth and Weymouth.

By the mid-1960s, the site had nine research and experimental reactors, with colourful names such as Zenith, Zero, Dimple, Dragon and Zebra. An apprentice training school and post-irradiation examination facility were also key parts of the unique world-leading facilities which harnessed some of the finest engineering and scientific expertise of the time.

The most famous landmark was the iconic Steam Generating Heavy Water Reactor (SGHWR), the only Winfrith reactor to provide power to the national grid. In its lifetime, it produced enough power to supply a small town.

The last reactor closed in 1995 and seven have been completely decommissioned and demolished, with only two remaining: DRAGON, a prestigious high-temperature helium-cooled facility which closed in 1976, and the SGHWR which closed in 1990. Both are now in the 'care and maintenance' phase, signalling the completion of early decommissioning work. They will be maintained and monitored until they are dismantled for transfer to the Geological Disposal Facility (GDF).

Meanwhile, in the early 1990s, the eastern part of the site opened its gates to tenant companies and became the Winfrith Technology Centre, with a strong focus on science and innovation. In 2004, the centre was transferred to English Partnerships.

EAST was built to store waste radioactive sludge from the SGHWR, while the role of the WETP which opened in 2005, was to deal with the sludge and other waste.

Now, with more than 30% of the clean-up programme at Winfrith complete, there are no high-hazard nuclear facilities left at the site and around 50% of the original area has been released for commercial use, employing many people.

spotlight on
Harwell

Mix of old and new lead to savings on pipeline project

Huge savings have been achieved from a project to decommission several miles of drains that once carried low-level radioactive effluent across the Harwell site.

The timeframe has shrunk by two-thirds, with associated cost reductions, after the team from Research Sites Restoration Ltd (RSRL) devised a new approach that allows the pipework to be cut up underground and the use of recycled equipment.

If the work continues at its present pace, engineers will have cut the decommissioning time by a remarkable two-thirds from the original projection of three years, while considerably reducing costs.

The site's New Main Active Drain System, which began operations 24 years ago, carried low-level liquid effluent from the major facilities to the Liquid Effluent Treatment Plant (LETP). Now no longer needed, work has begun to decommission the 4,000 metre-long system, which extends across the site and includes a series of delay tanks and 55 manhole-access chambers.

The drain line itself consists of two pipes, one inside the other, with the outer pipe made of bitumen-coated cast iron and the inner pipe of polypropylene.

Senior Project Manager Paul Atyeo said: "The outer pipe provided back-up containment in case of leaks. The inner pipe does not have joints except within the chambers, greatly reducing the chance of leakage or trapped radioactivity.

"When the system was built, the engineers envisaged the decommissioning process would reverse the construction process. That is, access ramps would be dug and the pipe pulled out and cut up on the surface – like giant spaghetti. But, after much thought, consultation and investigations, the team came up with an idea which we thought would work better."

The team's plan was to gain access to the chambers, feeding the inner pipe out in sections, so it can be cut up underground.

"This new method means many thousands of cutting operations underground, but practical methods were developed to do this which were quicker, more efficient and therefore more cost-effective," added Paul. "And, because less excavation is required, there is less potential for disruption to underground services."

Work began in May and was due to be completed soon after Christmas. Since the estimated timescale was three years, a huge saving in time and cost has been achieved.

Further cost-cutting was also achieved by recycling equipment from Harwell's sister site at Winfrith.

With the new method, the outer pipe and access chambers are left underground, but have to be proved to pose no liability to people or the environment.

"Proving the pipeline is clean requires a specialist health physics drain probe, which can crawl down the pipe, taking measurements and sending back images of what it finds," said Paul. "Luckily for us, just such a probe was designed and built at Winfrith some time ago."

"So, we dusted off the probe, refurbished and re-commissioned it, and put it to work. It is performing perfectly to date."

The network of contractors has included EDS, the primary contractor, alongside Nuclear Technologies and Aurora.

Above: Workers cutting up the pipework

New arrangements for Capenhurst

The future transfer of the NDA's Capenhurst site in Cheshire to its nuclear neighbour marks the latest in a number of transactions that have released the value from NDA assets.

Last year, the NDA and Westinghouse entered into a new arrangement involving the long-term lease of the Springfields fuel manufacturing site near Preston, while in 2009, agreement was reached on the sale of four separate plots of land adjoining NDA sites, worth approximately £500 million.

The opportunities arose in the wake of the Government's policy to support the construction of a new fleet of nuclear power stations, which has brought fresh commercial interest in land and facilities associated with the historic nuclear industry.

At Capenhurst, a range of outstanding, employment, legal and regulatory issues remain to be resolved during 2012. Once complete, the site will then transfer to URENCO UK Ltd which operates a number of fuel-enrichment plants on the adjacent site. Existing decommissioning and storage operations currently undertaken by Sellafield Ltd will transfer to URENCO. Land and buildings will also be transferred or leased to URENCO under a single site licence.

The NDA and URENCO have also signed an agreement for the processing of government-owned legacy material from uranium enrichment (known as "tails") through URENCO's own Tails Management Facility. Most of this material is currently stored at the NDA's Capenhurst site.

It is anticipated that the transfer agreement will reduce NDA's net liabilities and transfer responsibility for managing and clearing the site, while also paving the way for URENCO to invest in new facilities to meet future customer demand.

NDA Project Manager Sam Hounslow said: "For the NDA, this represents a major milestone in maximising the value from our commercial assets and achieving excellent value for the UK taxpayer while reducing NDA liabilities. The agreements also allow the NDA to continue discharging its ongoing obligations and reducing hazard at the site."

Site history

Now a long-term storage facility for a range of materials derived from uranium, the site began life in the post-war years producing highly enriched fissile material for weapons, which was extracted from natural uranium using the gaseous diffusion process.

The UK's only enrichment facility, Capenhurst Diffusion Plant was built in the early 1950s when it was the largest industrial building in Europe under a single roof, measuring more than 1,000 metres long by 150 metres wide. At one time, almost 4,000 people were needed to operate and maintain the facilities. Today, the site employs around 135 people.

In the 1960s the plant was converted to commercial production for nuclear power stations, but by 1982 alternative centrifuge enrichment technology had rendered the diffusion process uneconomic and the plant was eventually shut down.

Over the following years, a significant programme of decommissioning led to the dismantling, cleaning, recycling and disposal of redundant plant. The operation was complex, requiring meticulous analytical work to establish levels of contamination, remote cutting using robots, the melting of thousands of tonnes of metal and even the re-housing of a bat colony. Parts of the plant were demolished while the remainder was converted into a safe storage facility for uranium-derived material, or uranics.

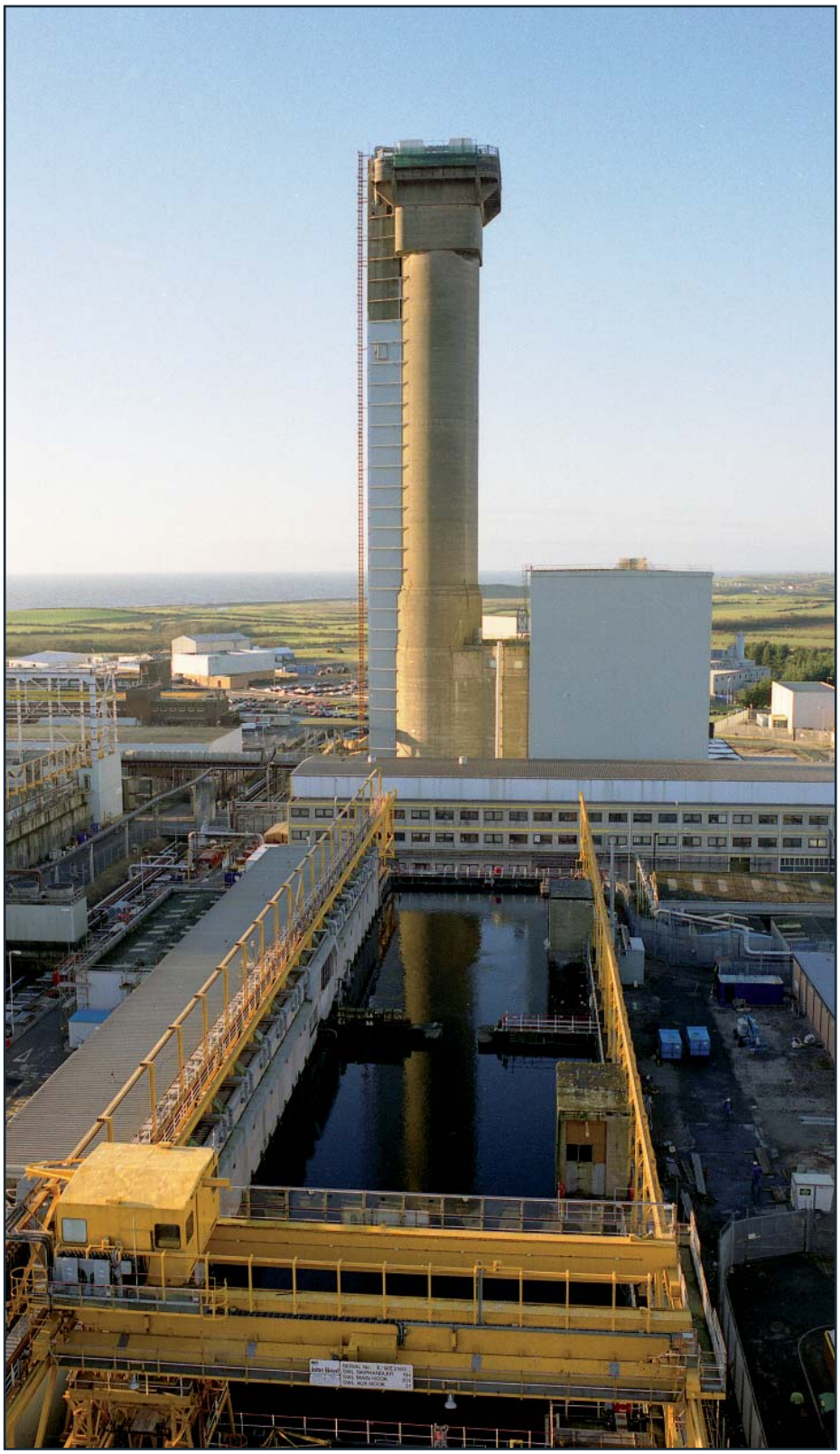
Progress was slow, however, with priority given to the operation of centrifuge enrichment plants on a different part of the site. In 1993, the site was split, with the civil enrichment business transferred to the newly formed URENCO, while the former diffusion plant continued with decommissioning.

In 1995 the Capenhurst site was confirmed as a long-term uranic storage facility. Refurbishment was initiated and a long-term maintenance plan developed. The site currently stores uranium hexafluoride tails (a by-product of the enrichment process) and other uranium materials. Capenhurst site shares a common site boundary with URENCO which operates its own licensed site for uranium enrichment.

Top: The NDA's Capenhurst site will transfer to its nuclear neighbour

Ultimate aim is a concrete slab

In the second of our series focusing on Sellafield's historic facilities, we look at the Pile Fuel Storage Pond. The world's largest open-air fuel pond and Sellafield's oldest, began operations in 1952 after a four-year construction period. It was initially used for cooling irradiated fuel from the Windscale Piles before reprocessing.



Subsequent modifications also allowed it to receive spent fuel from the Magnox reactors at nearby Calder Hall.

An adjoining building, the decanning plant, was used for removing the fins and other metallic components surrounding the fuel elements.

The pond is divided into sections, with a series of sub-ponds known as bays which are connected under water.

Kevin Newland, Pile Fuel Storage Pond (PFSP) Technical Manager, said: "The pond is open to the elements, and so we have to be extremely cautious as we remove the contents as there is no building to contain any radioactive contamination. We need to prevent any radioactive materials being released into the environment and so we're always looking for new and innovative techniques to complete the decommissioning."

Operations were scaled down following the closure of the Windscale Pile reactors and the commissioning of the First Generation Magnox Fuel Storage Pond, although the facility was still used as a cooling and decanning facility for some materials.

When decanning stopped in 1962, the pond continued to be used as storage for fuel, contaminated items and operational waste. All operations at the pond ceased in the 1970s.

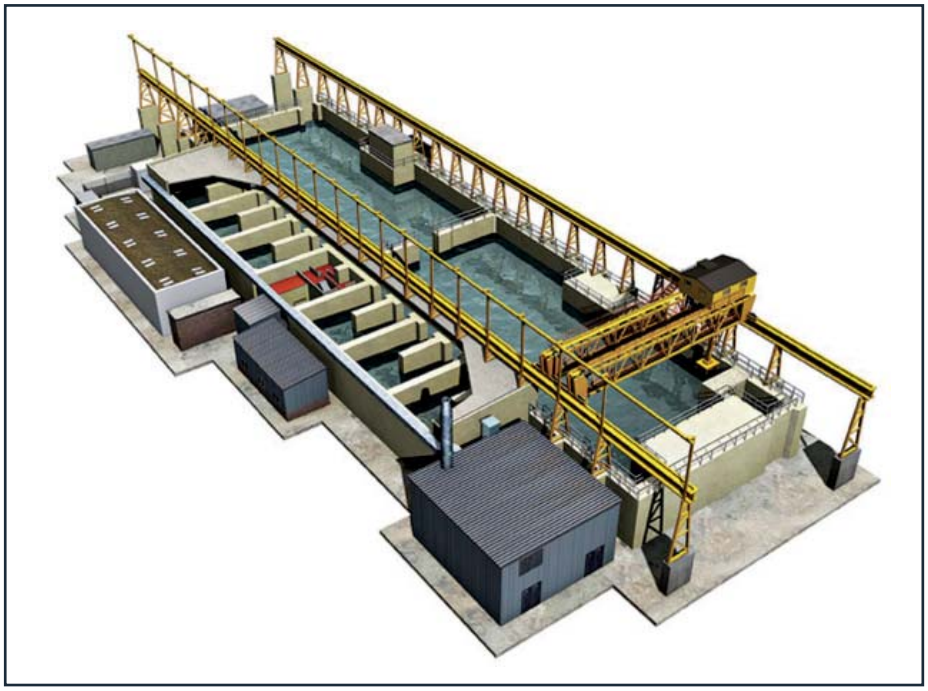
During its life, the pond processed 2,100 tonnes of pile fuel and 300 tonnes of Magnox fuel.

It now contains skips of used nuclear fuel, accumulated sludge, intermediate level waste and pond water, all of which need to be safely removed and subject to separate processes.

The area round the pond is very congested, posing practical difficulties, while levels of radiation are high.

The ultimate aim is to empty the pond and reduce the building to a slab. With a total programme cost of almost £330 million until 2025/26, work will focus on safe removal of the radioactive contents, including the sludge and spent fuel which can be processed, and the construction of a new plant for treating and storing the sludge before it is transferred to the deep Geological Disposal Facility (GDF).

Picture: Pile Fuel Storage Pond



“The pond is open to the elements and so we have to be extremely cautious as we remove the contents”

Kevin Newland, Pile Fuel Storage Pond Technical Manager

Windscale Piles

The Windscale Piles are a separate part of the Sellafield site and consist of three reactors

The first two reactors were built just after World War II to produce plutonium for the country’s nuclear weapons programme. Housed in tall concrete buildings, they were closed seven years after opening, in 1957, following a fire

The Windscales Piles never actually generated electricity, but were the precursor to the Calder Hall reactor – the first commercial reactor in the world

A third reactor, the Windscale Advanced Gas Cooled Reactor (WAGR), was subsequently built as an industrial-sized prototype for the current fleet of Advanced Gas Cooled Reactors (AGRs) that are still generating electricity today

Fuel retrieval milestone

Towards the end of last year, fuel was retrieved from the pond for the first time in 50 years and five years earlier than expected.

The retrieval marks an important step towards decommissioning and reflects the drive to meet the new Sellafield Performance Plan, which details the step-by-step decommissioning of the Sellafield site.

Following approval from the regulators, the half-tonne of retrieved fuel was transferred from the pond to a transport flask and exported to the modern fuel storage pond where it will be held pending final disposal.

Mark Steele, NDA’s Interim Head of Programme for Sellafield, said: “Successfully achieving this milestone in our priority work area is extremely encouraging. The combination of the expertise of the Sellafield workforce alongside targeted support from NMP to improve delivery and make the site more efficient, is exactly what we envisaged when NMP won the Sellafield contract and what the recently published Performance Plan demands across the site.”

Dorothy Gradden, Head of Programme Delivery, said: “It’s the first time since 1964 that we’ve been in a position to safely export nuclear fuel, the majority of which was burnt in the Windscale Piles reactors. There are almost 50 skips, containing 6-12 tonnes of spent nuclear fuel, to be exported from the legacy pond.”

Progress so far has included:

Installation of an effluent treatment plant to control activity of the pond water

A corral within the pond that provides storage for the sludge before treatment

36 empty fuel skips already retrieved, creating more room to deal with the sludge

Design of an in-pond sludge retrieval hood to assist with cleaning the pond

Installation of a suite of bespoke sludge retrieval tools

Construction of the Local Sludge Treatment Plant which is now undergoing inactive commissioning

Improvements to the building structure

Establishment of a proven export route for metal fuel

Extensive preparations to allow use, for the first time, of the transport flask

Left: Skip removal taking place

spotlight on Defuelling

The world's first commercial nuclear power station, Calder Hall, has started to remove the spent fuel from its reactors in a programme which will take up to six years.

Calder Hall was formally opened at the Sellafield site by the Queen in 1956, watched by scientists and statesmen from 40 different countries as well as an audience of several thousand people.

Hailed as a ground-breaking development for the country, the four reactors generated electricity until 2003 and paved the way for the 10 Magnox plants that were subsequently built in the following decades.

Its initial output of 168MW eventually rose to 220MW following technical modifications, enough to power around 100,000 typical households. As the Magnox design improved, more modern stations became more efficient, with the most up to date, Wylfa, generating more than 1,000MW and able to provide power for 40% of Wales.

The Calder Hall defuelling programme builds on the successful demolition of the cooling towers in 2007 and the removal, over five years, of 2,300 tonnes of asbestos. The fuel elements will be removed from the reactors and transferred to reprocessing facilities on the Sellafield site. When the programme is complete, the reactors and associated infrastructure will be progressively decommissioned to enable the site to enter into a 'care and maintenance' phase.

Mark Steele, the NDA's Interim Head of Programme for Sellafield, said: "Calder Hall is a name synonymous with nuclear power and its contribution as a pioneer of the industry cannot be overstated.

"The defuelling of Calder Hall is a key part of our overall programme of safely decommissioning the first fleet of UK nuclear power stations. This current stage builds on the successful cooling tower demolition and asbestos strip. I congratulate the team on safely and successfully reaching this milestone and look forward to continued progress."

Further north, meanwhile, Chapelcross in Scotland has now passed the halfway stage in removing its 38,075 fuel elements. The first flask containing spent fuel was sent to Sellafield for reprocessing in April 2009, after the regulators gave formal permission for the work to start, with an expected completion date of March 2013.

More than 19,000 fuel elements have now been removed from the four reactors in 128 flasks, each containing an average of 144 elements. Approximately 250 shipments will be needed to complete the defuelling.

"Calder Hall is a name synonymous with nuclear power and its contribution as a pioneer of the industry cannot be overstated"

Mark Steele, NDA Interim Head of Programme, Sellafield

Co-ordination keeps deliveries on track

Defuelling is a complex, lengthy process that takes place over a period of years and represents a major element in addressing the NDA's highest hazards: spent fuel contains 99% of a site's radioactive inventory.

Detailed co-ordination of all activities is required to ensure a smooth sequence of transports and efficient operation of the reprocessing facilities at Sellafield. Known as the Magnox Operating Programme, or MOP, timeframes and targets have been established for each site, with regular reviews to take account of significant changes.

Much of the infrastructure and plant at Sellafield date back many years and breakdowns do impact on performance. To address this, an ambitious and comprehensive improvement programme has been developed.

A stronger partnership between all participating sites has improved progress dramatically over the last 18 months with some significant challenges faced and overcome including significant issues with the availability of fuel transport flasks and the impact of unplanned stoppages in reprocessing.

The MOP, now at version 8, is currently being updated to reflect a need to recognise variations in defuelling and reprocessing performance - such as dealing with potential plant or equipment failure - that could affect timescales. MOP9 is due to be finalised later this year.

Defuelling progress

Eleven first-generation nuclear power stations were constructed in the UK based on the Magnox design

Calder Hall is run by Sellafield Ltd while Chapelcross is one of 10 sites operated by Magnox Ltd

Five sites have already completed defuelling: Berkeley, Bradwell, Hinkley A, Hunterston A and Trawsfynydd

A further four are at different stages in their defuelling programmes: Calder Hall, Chapelcross, Sizewell A and Dungeness A

Dungeness, while delayed from its original start of defuelling in 2008, has recently been defuelling and shipping fuel reliably at a rate of four flasks per week for the last 18 months and expects to ship its last fuel in April/May of this year

Once Dungeness completes, Sizewell A will ramp up to full capability while Chapelcross expects to complete in 2013

To date around 50,000 tonnes of fuel have been manufactured and used in Magnox reactors, generating 1,000 TWhr of electricity

1,000 TWhr hours is equivalent to enough electricity to power five million homes for 45 years

Of the 50,000 tonnes, over 90% has been successfully reprocessed

Less than 3,000 tonnes remain in reactors at Wylfa, Oldbury, Sizewell A, Chapelcross, Dungeness A and Calder Hall

Above: Defuelling at Chapelcross Below: Fuel leaving Chapelcross on its way to Sellafield

World's oldest working reactor closes with a flourish

After 44 years of safely generating electricity, the world's oldest working nuclear power station was finally set to turn off the power at the end of February.

Oldbury, near Bristol, was originally due to close in 2008 but gained approval to continue following safety reviews with the site's regulators and has since generated electricity worth an estimated £300 million to the taxpayer.

One of its reactors closed last summer, in line with its scheduled programme, while the second reactor was able to continue generating.

The last months were marked by a campaign to maximise electricity generation, with a complex inter-reactor transfer programme to move useable fuel to the second reactor, which successfully increased output by 6MW.

Meanwhile, members of the workforce were also beginning to prepare for the defuelling and decommissioning phase that will take place over the years ahead.

During its lifetime, the site produced enough power for more than one million homes over 20 years.

Dr Brian Burnett, NDA's Head of Programme, said: "Oldbury has a long and proud history of safely generating electricity. Our thanks go to the Magnox workforce who have been extremely committed to maximising the plant's generating life, ensuring it was able to continue past its original planned closure date. Its income has been valuable in supporting our mission to decommission the UK's first generation of civil nuclear sites."

In addition to many years of power generation, Oldbury starred in numerous TV shows including Doctor Who and Blake Seven, while Slade recorded a performance on one of the pile caps for an episode of Top of the Pops.

Above: Inside one of the reactor buildings

Below: An external view of Oldbury

Final fuel elements arrive at Wylfa

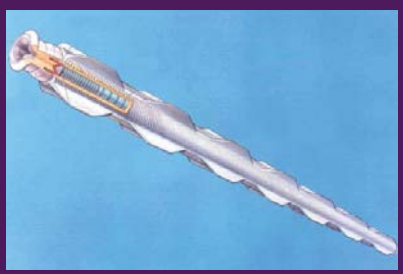
Fact file

The Magnox fleet became the first generation of commercial nuclear power stations in the world

A fuel element is made up of a uranium metal rod encased in magnesium alloy, giving rise to the name 'Magnox'

When Oldbury closes, Wylfa will be the last remaining generating Magnox plant

Wylfa is currently scheduled to shut down at the end of 2012, but, subject to safety case approval, could continue to operate one reactor until 2014, using up existing fuel stocks



Magnox fuel elements

Wylfa Site has taken delivery of the last Magnox nuclear fuel elements ever to be manufactured, with the last bulk delivery arriving just before Christmas.

Approximately 5.5 million Magnox fuel elements have been produced by Springfields Fuels Limited, near Preston, since 1955 – with more than 600,000 destined for Wylfa.

Nick Gore, Wylfa Site Director, said: "This is a significant event for Wylfa and the nuclear industry as a whole - it marks the end of an era. I must congratulate all of the staff who have been involved with fuel delivery, inspection and dispatching over the years, and those who have looked after each and every one of the fuel flasks in a safe and controlled manner."

Magnox-type reactors were pioneers of the civil nuclear industry, with the first commercial nuclear power station at Calder Hall coming on line in 1956. Wylfa and Oldbury (currently the world's oldest operating nuclear power station) are the last remaining operating Magnox stations.

At Wylfa, fuel that has been used (or 'spent') is moved into Dry Store Cells on site, before finally being dispatched to Sellafield for reprocessing.

This last fuel will be checked and inspected before being loaded into the site's fuelling machine. This machine will remove the old fuel elements out of the reactors and at the same time replace it with the new elements.

Last year, Wylfa celebrated 40 years of generation and has safely supplied enough electricity to meet the needs of one million British households.

Above: Springfields staff involved in Magnox fuel production witness the final fuel elements being loaded for delivery to Wylfa.

"This is a significant event for Wylfa and the nuclear industry as a whole - it marks the end of an era"

Nick Gore, Wylfa Site Director

Land released from nuclear regulation

Large tracts of land at two Magnox sites have been officially sanctioned as available for new development after the last remaining nuclear regulations were removed.

The land at Oldbury and Berkeley is equivalent to around 100 football pitches and can now be disposed of either by sale or for lease after the Energy Minister Lord Marland signed orders revoking the designating directions on a total of 46 hectares at the Gloucestershire sites. Each plot has already been released from the conditions of its nuclear licence, or de-licensed.

NDA Head of Property Services David Atkinson said: "This is a major achievement for the NDA in terms of returning these pieces of land to the market. We are extremely proud to have reached this stage which marks the culmination of a huge amount of work by the NDA, Magnox Ltd and their contractors."

2010 marked the first time that land had been fully released for further use, when two plots of land at Capenhurst, totalling seven hectares, were transferred to the neighbouring nuclear site, URENCO. The lifting of all nuclear regulations covering the Oldbury and Berkeley plots marks the largest release of land since the NDA was formed.

At Oldbury, half of the original site has been released including one of the three silt lagoons. Last year, it was the largest single portion of land to be de-licensed in the UK and followed the submission of a detailed safety case that involved surface surveys of grounds and buildings, plus analysis of soil and sediment samples to assess the impact of operations over the past 50 years.

Part of the 35 hectares will now to be used by Horizon Nuclear Power, a joint venture between E.ON and RWE, who are developing plans for a new nuclear power station on land north east of the Magnox site.

The 36 hectares remaining within the nuclear licence contain the site's operational plant, including the turbine hall and reactor buildings.

A fifth of Harwell land de-licensed

For the first time in decades, it is now possible to walk across the front of Harwell site without stepping on nuclear licensed property.

Some six hectares of land outside the Eastern Entrance of the site and in the area known as the North Gate has been released from the nuclear site licence by the Office for Nuclear Regulation (ONR).

Site operator Research Sites Restoration Limited (RSRL) has now cleaned up and delicensed 20% of the entire Harwell site following the 2010 de-licensing of seven hectares and 11 hectares in 2006.

The latest change came into effect in January when signs were moved to mark the reduced boundary of the nuclear licensed site.

“De-licensing represents the final stage of the nuclear life cycle and demonstrates that RSRL has completed its mission on that area of land,” said Alan Neal, RSRL Managing Director.

To enable the de-licensing, RSRL had to carry out extensive surveying and sampling works to demonstrate that any radioactive and non-radioactive contamination of the land had been addressed.

The NDA is now seeking to ‘de-designate’ the area, allowing the land to become part of the wider Harwell Oxford campus that houses a range of high-tech businesses and research organisations.

At Berkeley, meanwhile, about a third of the original site is being marketed for use as a business park after revocation of the designating directions.

The 11 hectares, out of the total 38-hectare site, comprise a range of buildings including offices, warehouses, laboratories, engineering workshops, stores, substations, a pump house, waste management compounds, café, conference centre, security lodge and car park.

Known as the Berkeley Centre, the offices and labs were established as a centre of nuclear research and development for the UK electricity supply industry back in the 1960s. Later, the Berkeley Centre provided direct engineering and technical support to all the Magnox power stations.

Many buildings had no history of radiological use while others, including radio-chemistry labs and waste facilities, were decommissioned and demolished.

The site achieved de-licensing in 2006, the first de-licensing since the NDA was formed.

With revocation of the designating direction, the final piece of the jigsaw has now been completed, marking the end of the NDA’s clean-up mission at Berkeley Centre.

Opposite: De-designations at Berkeley - the released land lies to the north of the reactors

Top: A Berkeley waste compound reaches the end

Designating orders

The 2004 Energy Act established the NDA and also designated which sites and facilities would fall within its decommissioning remit.

Revocation of the directions giving the NDA responsibility for a site is issued by the Secretary of State.

‘De-designation’ allows the site to be transferred to another business operator and brought back into use for a different purpose.

The nuclear licence

A nuclear licence is issued by the Government’s Health and Safety Executive (HSE) to nuclear installations and lays down strict conditions covering activities.

Removal of the licence, or de-licensing, must be approved by the HSE’s Office of Nuclear Regulation (ONR).

De-licensing at Oldbury and Berkeley was one of the last major milestones in the decommissioning process for the two plots of land.

Hinkley collaboration keeps lorries away

A joint initiative by the Magnox site at Hinkley Point A and EDF Energy, developers of the proposed new Hinkley Point C power station, will keep thousands of lorries off local roads and fill a large hole in the old turbine hall.

EDF Energy are removing spoil from the site, while the NDA-owned decommissioning A site would have eventually needed aggregate to infill the deep basement of the turbine hall, now emptied of generating equipment and awaiting demolition.

The collaboration has led to a dovetailing of timetables and means a massive reduction in the number of transports that would have been required by both organisations, as well as cost savings.

The Hinkley turbine hall was the largest in Europe when it was built in the 1950s and has been in the process of decommissioning since 2003, when the removal of bulk asbestos began. In 2006, this was followed by the huge task of clearing all conventional plant out of the building. Levelling off the site by infilling the basement was originally planned for 2019, but the Magnox-EDF Energy initiative led to extensive work to bring the date forward.

Fact file

6,000 lorry movements were kept off local roads

Enough spoil to fill 20 Olympic swimming pools - 50,000 cubic metres – has been used to fill the basement

11,000 tonnes of scrap metal were removed from the turbine hall during the deplant, equivalent to 40 Airbus aircraft

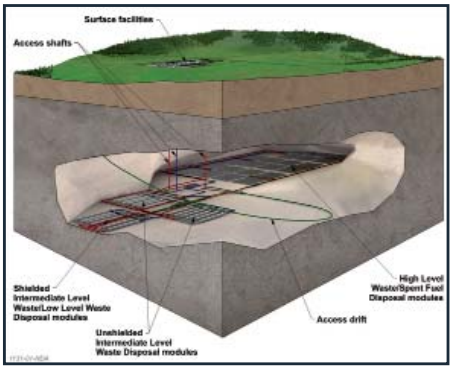
389 tonnes of asbestos and man-made mineral fibres were also removed

One of the turbine alternators was bought by Alstom for use at their Leicestershire training centre

Above and left: Trucks empty spoil into the basement area of the turbine hall

Finding out more about a geological disposal facility

The opportunity remains open for communities to get involved in the voluntarist and partnership process to consider the benefits and impacts of hosting a geological disposal facility.



In 2003, the UK Government set up the Committee on Radioactive Waste Management (CoRWM) to consider the question of how higher activity waste should be managed in the long-term. In July 2006, CoRWM recommended geological disposal as the best available solution, with safe and secure interim storage in the meantime, and ongoing research and development to support its optimised implementation. This is the internationally preferred approach, being taken forward by countries including Finland, France, Sweden and the USA.

In 2008, Government published the Managing Radioactive Waste Safely White Paper, which set out a framework for the future implementation of geological disposal[1].

Construction and operation of a geological disposal facility, or GDF, will be a multi-billion pound project, comparable in size and scope to that of building the Channel Tunnel. It will provide skilled employment for hundreds of people over many decades. It will likely involve investments in local infrastructure, and could result in wider benefits to local communities around a facility.

Siting a facility also raises potential impacts, some of them intergenerational, and these will need to be addressed over the long timescales involved. Government and the NDA's delivery organisation are keen to explore with potential host communities the local needs that would arise from hosting a GDF, and how a disposal facility can be implemented so that it develops their social and economic wellbeing.

Government is pursuing a voluntarist approach to siting a GDF. Communities are invited to express an interest in finding out more about what hosting a GDF would mean for their community in the long-term. This process of engagement is staged, and tailored to local circumstances. The early stages allow people to find out more without any commitment attached - a clear right of withdrawal exists until much later in the process.

At the moment, three local authorities – Allerdale and Copeland Borough Councils and Cumbria County Council – have expressed an interest in finding out more about hosting a geological disposal facility. They have carried out extensive local public and stakeholder engagement, wholly funded by Government, to explore the issues of importance to them. The local Partnership organisation formed to carry out this work is currently consulting on its findings and will report to the local authorities to inform their decision on whether to participate in the next stage of the process.

It must be made clear that no decisions have been taken in West Cumbria on proceeding to the next stage and, even if they were, the right of withdrawal would continue into the later stages. The opportunity for other parts of the country to get involved in the siting process, without commitment, is very much still open and more information can be obtained directly from DECC at: john.dalton@decc.gsi.gov.uk

[1] For England, Wales and Northern Ireland. The Scottish Government had developed a different policy for waste in Scotland.

Science Council approves RWMD

RWMD is the first employer to have its professional development scheme for scientific staff approved as part of the Science Council's pilot employer Continuing Professional Development (CPD) approval scheme.

The scheme, launched in partnership with the Council's licensed professional bodies, recognises good practice in employer learning and development schemes. Many professional bodies already accredit the graduate training schemes of large employers, however, historically less attention has been paid to the support and development of scientists beyond the point of registration.

The Science Council scheme aims to reverse this trend and recognises employers who provide a supportive framework for staff CPD.

Bruce McKirdy, RWMD Managing Director, said: "We are committed to the continuing professional development of our team and I am delighted that we are the first to achieve Science Council approval under the new scheme."

Diana Garnham, Science Council CEO, added: "The commitment of employers to the continuous professional development of their workforce is fundamental to the professional practice of science so I am delighted that our first partner employer is from such an important area of the economy."

The Science Council works to advance science for public benefit, supports the professional practice of science at all levels and promotes the profession through the Chartered Scientist designation.

Scientists, engineers and industrialists meet to discuss geological disposal of radioactive waste

“We can safely say the next generation of scientists and technologists are well represented here” Dr Neil Smart

Dr Smart, Science Director of the NDA’s Radioactive Waste Management Directorate, was speaking at a conference ‘Geological Disposal of Radioactive Waste: Underpinning Science and Technology’ which was organised by a number of the UK’s Learned Societies.

The event took place at Loughborough University at the end of last year and, brought together scientists, engineers and technologists to discuss a wide range of technological issues associated with the long-term management of radioactive waste in the UK.

Dr Smart said: "It is so important to debate these scientific and technological issues in an open environment. We are very keen in the NDA that our programme is subject to challenge through peer review."

"The Learned Societies have a position in the UK science framework for establishing sound science and that framework is extremely important to us in radioactive waste management, and most particularly in developing a geological disposal facility."

He had been overwhelmed by the response from the science and technology community to the event. "We expected about 80 people and had 180."

The general consensus from attendees was that the event had been a useful opportunity to meet colleagues from different scientific disciplines as well as the technologists, representatives from the supply chain, post-graduate and graduate students.

Over the two days, delegates heard 42 presentations on the work of the science and technology community and took advantage of the opportunity to question and challenge the presenters. There were also a number of themed poster presentations featuring work currently being undertaken by scientists and technologists.

One delegate said the concept of geological disposal of radioactive waste was difficult to explain to the public especially as there were issues which are not known at this stage, but over time research and development would answer these questions and hopefully this would lead to greater public understanding.

Dr Smart added that the conference was just the starting point to bring the disciplines together and he thanked the Learned Societies for organising the event and looked forward to further events.

"There are lots of opportunities for collaboration and programmes of work that will come out of this conference," Dr Smart added.

Conference report

By Dr Raymond Kowe, Research Manager, RWMD

The conference was organised by the Learned Societies including: the Royal Society of Chemistry, the Geological Society, the Institution of Civil Engineers, the Nuclear Institute, the Institute of Chemical Engineers, the Royal Academy of Engineering, the Mineralogical Society and a number of other learned societies. The event was supported by the NDA's Radioactive Waste Management Directorate (RWMD).

The overarching theme was to establish 'sound science' in the field. A special edition of the Mineralogical Society magazine will be published in early 2012 featuring the refereed papers from the conference, which will serve as a benchmark for the current status of the science and technology.

Research has recently been reported in the Disposal System Safety Case (DSSC) (www.nda.gov.uk/aboutus/geological-disposal/rwmd-work/dssc/) which considers the safety of radioactive waste transport to a GDF as well as construction and operation of the facility, and the very long-term, post-closure safety. RWMD is seeking to bring this peer-reviewed work further into the public domain and for independent oversight to be provided by the Learned Societies.

The conference brought together scientists, engineers and other specialists to discuss the chemical, biological, geological, hydrological, materials, engineering and other scientific issues associated with the long-term management of radioactive waste in the UK. Attendees included post-graduate researchers, PhD students, academics and industrialists.

The meeting was opened by Dr Nick Evans, Senior Lecturer, Loughborough University, who explained that the conference followed two previous events but was broader in scope and the only one of its kind aimed at providing open communication on all issues surrounding deep geological disposal in the UK.

Dr Neil Smart, Science Director, NDA RWMD, said the purpose of the conference was to ensure all decisions were based on sound science. The collaboration of the Learned Societies would ensure the science was aired publicly and subject to peer review and thorough testing by the scientific community.

Speakers included Bruce Cairns, from the Department of Energy and Climate Change (DECC), who gave a perspective on the Government's Managing Radioactive Waste Safely (MRWS) programme, Dr Cherry Tweed, Chief Scientific Advisor at NDA RWMD, who gave an overview of the role of science in the implementation of geological disposal in the UK and Professor Linda Warren who outlined the current work programme of the Government's Committee on Radioactive Waste Management (CoRWM).

Eight sessions, which included 42 presentations and 67 posters, covered the following themes:

- Waste forms and containment materials
- Engineered barriers (near field)
- Strategic, social and ethical overview
- Biosphere
- International work
- Radionuclide transport
- Geosphere (far field)
- Gas

Professor Kym Jarvis of Imperial College, London, concluded with an overview of the EMpower scheme, which provides a taste of nuclear to MSc students, through project placements and activities such as lecture days, visits and other networking opportunities. Eight students spoke about their placements and a prize for the best student poster was awarded to Nadya Rauff-Nisthar of Loughborough University on the theme 'Radioactive sludge chemistry'.

The presentations are on the Royal Society of Chemistry website (www.rsc.org/Membership/Networking/InterestGroups/Radiochemistry/PastEvents.asp).

Energy centre puts Wales in seat of power

A student at work

A massive boost for training and skills in the energy sector is under way in North West Wales, following the opening of a £6 million centre at Coleg Menai on Anglesey.

The Canolfan Ynni, which received a £1.5 million contribution from the NDA, houses some of the best low-carbon energy technology, equipment and training facilities in the UK.

The majority of funding has come from the Welsh Assembly Government and the college.

Specialised courses will provide training to young people for the energy industry, while the centre will house the most advanced welding and fabrication facilities in Wales, together with a business innovation department and first-class conference amenities. The latest in sustainable, low-carbon technologies were used during the building's construction.

The Energy Centre was officially opened at the end of last year by Wales' First Minister Carwyn Jones, who said the facility was an integral part of Anglesey's drive to become an 'energy island': "Wales once led the world in carbon-based energy. Our goal now is to do the same for low-carbon energy."

The NDA's Director of Communications and Stakeholder Relations, Jon Phillips, said: "We are committed to supporting efforts to minimise the local impact of decommissioning of Wylfa Power Station and are delighted to be making this contribution to Canolfan Ynni. The commitment from the NDA Socio-Economic Fund will support a major workforce transition in the next few years and will go a long way in helping to develop the skills local people need to meet future job demands of the energy sector."

Coleg Menai's Principal, Dafydd Evans, added: "It is more important than ever that our young people have the necessary skills to compete for jobs in any sector. However Canolfan Ynni is unique in being able to provide skills and training for the low-carbon energy industry. This is crucial to our economy as the sector is expected to offer considerable growth potential both locally and nationally in years to come."

Sasha Wynn Davies, Anglesey Energy Island Programme Director, said: "The Energy Centre demonstrates Coleg Menai's real vision and commitment to maximising the very real opportunities arising from the existing Wylfa nuclear power station, proposed Horizon Nuclear Power new nuclear build at Wylfa and wider Energy Island projects."

Energy Island

The Energy Island initiative is a collaborative drive between a range of private and public-sector organisations, including the NDA, to establish a world-class centre of excellence for energy developments in North West Wales.

Led by Anglesey County Council, the focus is on energy efficiency, low-carbon energy developments, nuclear decommissioning, supply chain development, infrastructure enhancement, skills and education.

Among the guests at the opening were, from the left: College principal Dafydd Evans, SSG Chair Aled Morris Jones, First Minister Carwyn Jones, NDA Communications Director Jon Phillips and Energy Island Programme Director Sasha Wynn Davies

Queen's tribute to nuclear research

World-leading nuclear research carried out at Manchester's Dalton Nuclear Institute has been awarded the Diamond Jubilee Queen's Anniversary Prize for Further and Higher Education.

The Institute, part of The University of Manchester, has recently opened a research centre in West Cumbria, the Dalton Cumbrian Facility (DCF), in a £20 million joint investment by the NDA and the University.

The announcement paid tribute to the "internationally renowned research and skills training for the nuclear industry" carried out at the Manchester-based institute, and was made by the Royal Anniversary Trust, by kind permission of Her Majesty The Queen.

The prizes are the UK's most prestigious form of national recognition, rewarding high-quality work taking place in higher and further education.

NDA Chairman Stephen Henwood said: "The success of world-leading research and development and applying it through innovative ideas into nuclear decommissioning work programmes is a key part of driving our mission forward.

"There are close links between the NDA and the University, none more so than our partnership here in Cumbria with the DCF. So it was especially pleasing to hear that the development of that facility and its role in the broader Britain's Energy Coast agenda was an integral part of gaining the award that is probably the highest form of national recognition available to UK academia.

"I look forward to that partnership continuing to flourish and to witnessing the benefits the DCF will bring to both our mission and West Cumbria."

The 'Diamond Jubilee' (ninth) round presentations to representatives from the winning institutions were being made in February 2012 by Her Majesty The Queen at Buckingham Palace.

Further information: www.manchester.ac.uk/dalton

New executive team on the ground

Members of the Babcock Dounreay Partnership's prospective new executive team have been familiarising themselves with the Scottish site, following the NDA's announcement last year that the consortium was its preferred bidder to become the new Parent Body Organisation for Dounreay Site Restoration Ltd.

Led by Roger Hardy, Babcock's Managing Director and Dounreay Managing Director Designate, the team is spending time in the area during the three-month transition period as work continues on finalisation of the contract between the NDA and BDP, which, subject to a successful conclusion, will lead up to the contract award at the end of March.

BDP is a specially created consortium comprising Babcock International Group, CH2M Hill and URS Holdings (UK) Ltd.

The Dounreay competition, which began two years ago, will be the first closure contract award to take one of the NDA's sites to an agreed Interim State and will only conclude following a successful transition. The second bid will remain in reserve until the contract award and transfer of DSRL shares to BDP.

One of BDP's first major announcements was to the Dounreay Site Stakeholder Group, where Mr Hardy informed community representatives, regulators and government representatives that BDP anticipates reaching the Interim State – when all major decommissioning work will be complete – between 2022 and 2025, up to 17 years earlier than the estimated 2038 date announced two years ago.

One of the key criteria for the competition to appoint a world-class contractor was to bring forward decommissioning timescales and reduce costs by at least £500 million.

In a ground-breaking move for the NDA, BDP would also be contractually committed to continuing to support the NDA and other community bodies in a wide range of socio-economic initiatives aimed at helping to diversify the economy away from dependence on Dounreay.

Nigel Lowe, NDA Head of Programme at Dounreay, said: "The Dounreay contract is a target cost incentivised fee model and it, together with the technical challenges of Dounreay, will require a different paradigm for how the NDA's Site Facing Team and the NDA collectively interfaces with the new PBO and DSRL. It is an exciting time and we are all looking forward to what lies ahead."

Roger Hardy said: "Being selected as preferred bidder is a fantastic achievement. BDP brings together outstanding international decommissioning and site management expertise and we look forward to working with NDA and the teams at DSRL to complete the closure programme safely and cost effectively."

Competition is central to the NDA's strategy as part of its statutory duty to secure value for money while promoting competition and best practice.

Above: NDA Programme Director Nigel Lowe (left) greets BDP's Roger Hardy

Next competition

Later this year, the NDA will launch a formal competition to appoint a new contractor for both the Magnox Site Licence Company and the Research Sites Restoration Limited (RSRL) Site Licence Company.

An informal market survey has already provided feedback from potential bidders on a possible strategic approach, and a more formal engagement with the market will take place in the months ahead, once the NDA has finalised the structure of the competition.

Rail transports bring all-round savings

Substantial savings are set to be made across the nuclear industry by switching from road to rail for the focus of low-level radioactive waste transports.

In a recent trial at the NDA's Bradwell site in Essex, 10 half-height containers were successfully loaded onto a single train and transported to the Low Level Waste Repository (LLWR) near Drigg, Cumbria.

The normal means of transport would have been 10 separate journeys, using specialist transporters travelling hundreds of miles by road to the LLWR.

However, by using spare rail capacity allocated to nuclear rail freight specialist Direct Rail Services (DRS), an NDA subsidiary, the costs are marginal while the reduction in road traffic and carbon emissions is of both safety and environmental benefit.

For sites without a rail head, a combination of road and rail could be used, providing an integrated service for all sites that need waste transport.

It is estimated that the new service will save 72% in carbon dioxide emissions and reduce road miles travelled by 64%.

The trial was led by LLWR which offers a transport service to all UK nuclear customers as part of its remit on implementing the UK's LLW Strategy, and involved collaboration between Bradwell site operator Magnox, DRS and LLWR.

Across the entire UK nuclear industry, LLWR estimates that there are around 300 journeys taking place each year at a cost of approximately £500,000. This is set to increase over the coming years as sites begin to demolish facilities and deal with the resulting waste – largely low-level material such as building rubble.

The success of the Bradwell trial also paves the way for greater use of rail for a wider range of lower-activity wastes, with the service being made available for commercial customers as well as the NDA estate from 1 April 2012. Further details of this will be available in the near future.

The opportunity arose through DRS's unused capacity - in the form of routes, locomotives, rolling stock, transport hubs and staff – within existing contracts that support the Magnox and EDF spent fuel programmes, where flasks are transported by rail to Sellafield for reprocessing.

Joanne Van Straaten, National Programme Delivery Manager for Waste, said: "The savings are very real, both in terms of costs for the taxpayer and the environment. In addition, there are very real opportunities to widen this service and look at transporting construction material, for example, to new build sites, or, further into the future, to transport Intermediate Level Waste (ILW) from stores to the Geological Disposal Facility (GDF)."

Jo added that the Bradwell trial had involved half-height ISO containers, however, and DRS's recent investment in lowliner rail wagons would allow full-height containers to be used across the rail network, transporting larger waste items.

Below: Waste is ready to leave by rail

British Safety Council

The British Safety Council was founded in 1957 and is now one of the largest independent occupational health, safety and environmental organisations in the world

Since 2003 it has been a government-regulated awarding body endorsing health, safety and environmental performance and standards

Its awards are open to both UK and international businesses across a wide range of industrial sectors. More than 600 organisations from the UK and overseas applied for an award in 2011 and 90% were successful

Left: Dounreay's environment team leader Doug Graham, left, receives the Globe award from British Safety Council Chief Executive Alex Botha

Recognition for safety achievements across NDA estate

2011 saw three of the NDA's sites prove themselves to be at the forefront of health and safety management internationally. Dounreay, Wylfa and Oldbury collected a series of honours from the British Safety Council.

Dounreay was awarded both the premier Globe of Honour for environmental performance and the Sword of Honour for workplace safety. It was one of only three businesses to earn both awards.

In addition Oldbury and Wylfa Power stations also achieved the highest marks against the five-star site audit, which earned each site the Sword of Honour. For Wylfa it was the third year running that its workforce had been awarded the Sword of Honour for demonstrating a culture of best practice for health and safety throughout business.

For Dounreay, achieving the Globe of Honour award was accompanied by a timely reminder of the need for the highest level of safeguards. Announcement of the award was delayed for a month pending confirmation that the site's safety systems had successfully protected the environment from harm when a litre of radioactive effluent leaked during destruction of the NaK liquid metal (sodium-potassium) at the experimental fast reactor.

DSRL was temporarily excluded from the announcement but later received confirmation of the award from the British Safety Council. Destruction of NaK resumed after a temporary seven-day shut-down.

Alan Scullion, DSRL Director of Assurance, said: "We work to high standards of environmental management that reflect the scale of the radiological and chemical hazards here that need to be reduced and destroyed. The recent event demonstrated how these standards work in practice.

"The risk of a leak had been identified during the planning for this stage of the reactor clean-up and sufficient controls were built into the design of the plant to ensure there was no harm to any individual or the environment from such an event. The incident proves the value of our environmental management systems. We understand the importance of decommissioning this site in a way that does not harm people or the environment."

Mark Lesinski, NDA's Executive Director Delivery said: "It's thanks to such a world-class culture of safety from dedicated workforces that the safety record across the NDA estate is looking better than ever, with safety performance across each of our sites ensuring the safest possible clean-up of the UK's nuclear legacy."