

INSIGHT

into nuclear decommissioning



Delivering progress across the UK

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Front cover: Dounreay's replacement supercompactor is manoeuvred into place.

Welcome to the first 2014 edition of Insight, the news magazine where we aim to provide a snapshot of some of the developments across the NDA estate.

If you have any comments, please contact the editor Deborah Ward on 01925 832280 or deborah.ward@nda.gov.uk

Two-year competition heading for final stages

The identity of the Preferred Bidder for Magnox and RSRL contract is due to be announced at the end of March.

Evaluation of the tender submissions from the four bidding consortia, which began in November, is now in the final stages and will conclude in February. The recommendations will be subject to a Government ratification process before the announcement is made.

The consortia are:

- The Cavendish Fluor Partnership
- CAS Restoration Partnership (CH2M Hill, Areva, Serco)
- UK Nuclear Restoration Ltd (AMEC, Atkins, Rolls Royce)
- Reactor Site Solutions (Bechtel, EnergySolutions)

A five-month transition period will follow, allowing all legal processes and due diligence to be carried out before the Preferred Bidder is confirmed as the new Parent Body Organisation (PBO) in September. The conclusion of the two-year competition will be marked by the transfer of Magnox Ltd and RSRL shares to the incoming PBO and the arrival of a new senior management team to oversee

decommissioning activities. Existing site workforces at the 12 historic nuclear sites will remain in place.

The contract, worth up to £7 billion over a 14-year period, represents one of the UK's largest public procurement exercises and is being managed in strict compliance with EU procurement regulations.

Nine of the Magnox sites in Scotland, Wales and England are nuclear power stations that have stopped generating and are in various stages of decommissioning, while one, Wylfa on Anglesey, is still generating electricity but is in the final stages of its operational life.

The two RSRL sites at Harwell and Winfrith are former research centres that housed some of the UK's earliest experimental reactors but are now well advanced in their decommissioning programmes.

Competition is central to the NDA's strategy for securing world-class skills and experience to drive forward decommissioning across its estate.

Additions to NDA team

The NDA has announced two new appointments to its executive team.

Peter Lutwyche will join the NDA in the newly created position of Sellafield Programme Director.

This follows the departure of Chief Operating Officer Mark Lesinski, who is returning to the US after nine years working in the UK nuclear industry.

Peter, who lives in west Cumbria, joins the NDA in March from engineering firm Jacobs, where he served most recently as vice president of its UK Operations

North unit. Prior to that, he held senior management positions in BNFL.

David Vineall has been appointed as the NDA's new HR Director. David joins from global steel giant Tata Steel, and previously worked for BAE Systems for 10 years. He takes up his new post on March 31, replacing outgoing HR Director Jim McLaughlin, who announced his decision to leave the authority earlier this year.

Councillor Richard Smith chairs the Nuclear Legacy Advisory Forum (NuLEAF). He is a Cabinet Member for Economic Development, Environment and Planning at Suffolk County Council and former Chair of the Sizewell A&B Sites Stakeholder Group

Engaging with the NDA for more than 10 years



By Richard Smith

The Nuclear Legacy Advisory Forum (NuLeAF) was formed in 2003 as a Special Interest Group of the Local Government Association for England and Wales.

At the time, Government was legislating for the creation of the NDA and tasking its newly formed Committee on Radioactive Waste Management to consult widely and make recommendations for a new policy on the future management of higher activity wastes. Both these developments were recognised at the time by local government as potentially having significant implications for areas hosting nuclear sites and for areas further afield.

NuLeAF's inauguration was quickly mirrored in Scotland with the creation of the Scottish Councils Committee on Radioactive Substances (SCCORS) under the auspices of the Convention of Scottish Local Authorities. Both groups now provide advice and support to NDA on behalf of their local government members in the implementation of its Strategy for nuclear decommissioning and clean-up.

Over 100 local authorities and three National Park Authorities support NuLeAF's work which is directed at an agreed overall aim, namely: 'That policy, strategy and practice for all nuclear waste and legacy issues has the interests of local authorities as a central concern, leading to the best possible outcomes for the communities they serve.'

To give effect to this aim, last October's NuLeAF annual meeting agreed a work programme for the year ahead which includes the following priorities:

- Advising on the development of a new siting process for a Geological Disposal Facility (GDF) for higher activity radioactive wastes



- Engaging with the NDA and Site Licence Companies to help shape the delivery of the national decommissioning mission, and feeding back developments in waste policy to NuLeAF members
- Working with Government, the NDA and others to develop a clear and consistent approach to community benefits for those areas affected by waste and legacy management issues.
- Contributing to ongoing work on Low Level Waste (LLW) policy and implementation, representing the concerns of local authorities, helping to shape a clear and coherent approach that meets local needs, and assist local authorities and operators to comply with developments in the national framework for LLW management and the planning process

This work is only possible with the ongoing financial support of the NDA. However, both NuLeAF and the NDA recognise that such support must be 'without strings'. NuLeAF's credibility within local government depends on it, and if the NDA is to hear and understand the authentic voice of one of its key stakeholder groups, then NuLeAF must continue to speak freely and constructively.

See: www.nuleaf.org.uk

Photograph:

Above, Richard Smith, MVO

spotlight on Sellafield



Contractors:

Energysolutions, Doosan Babcock and TATA Steel

Historic pond gives up its relics

Sellafield's oldest nuclear fuel storage pond is being systematically emptied of equipment that has been sitting under the water for decades.

Among the items retrieved from the Pile Fuel Storage Pond (PFSP) so far are a heavy decanning machine used to shave off the outer cladding from fuel elements and two old masts, each as tall as a two-storey house.

The PFSP, used to store spent fuel from the Windscale Pile, poses one of the site's most challenging decommissioning projects.

Construction began in the late 1940s and operations continued until closure in the 1970s. Following refurbishment in the 1980s, a programme is now under way to retrieve the contents,

drain out the water and accelerate decommissioning.

Last year, the team began to remove 750 tonnes of redundant metal structures and equipment.

The delicate job of lifting out the one-tonne historic decanner has recently been completed. It is thought that there were originally eight decanning machines in the PFSP, however records are unclear. The pile fuel's metallic cladding was removed before it was sent for reprocessing to separate out materials for the defence industry.

Chris Mounsey, PFSP Strategy Manager, said: "This is the last remaining pile fuel decanner which we found in one of the bays. It's a mystery why it wasn't removed with the rest of these pile fuel decanners in the late 1950s refurbishment programme, which saw the larger Magnox fuel decanners installed to support Calder Hall, before the First Generation Magnox Storage Pond (FGMSP) was built."

Several weeks of preparations went into the lift, which included extensive surveying and monitoring using the mini-submarine or, more correctly, a Remotely Operated Vehicle (ROV).

Recycling together

Waste is being shipped out of the PFSP using redundant skips recycled from the Magnox site at Chapelcross.

Saving £1 million in total, the initiative avoids the need to buy brand new skips at £14,000 each and became possible when Chapelcross finished defuelling last year.

The Scottish site had no further need for around 50 skips that were used to store spent fuel underwater, and discussions with Sellafield colleagues led to the innovative collaboration, which will also reduce the amount of waste that eventually needs to be disposed of.

Photograph:

A skip being lowered into PFSP



PFSP Intermediate Level Waste Manager Rob Smith said: “We’re always prepared to expect the unexpected which is the joy of decommissioning old plants! Detailed monitoring has confirmed the decanner is suitable to be sentenced to the Low Level Waste Repository near Drigg.”

Meanwhile, two long masts measuring 7-8.5 metres, were also retrieved from the bottom of the seven-metre-deep pond. The unique tools, used to close off the water ducts that once linked the PFSP and the Windscale Piles, were lifted out using remotely operated equipment and cut into more manageable pieces using a pneumatic reciprocating saw. The masts were then

cleaned to ensure they met the strict criteria for disposal to the Low Level Waste Repository.

The pond and the Pile reactors were originally linked by two submerged water ducts, along which bogies were winched carrying spent fuel and isotopes from the reactors.

Water duct isolation barriers were installed in the early 1980s as part of the early decommissioning work. One mast was used to pressure-wash the outer duct walls, and the other for drilling and fixing the isolation duct barrier into place.

Rob Smith added: “Once the masts had done their job, they were redundant and have been stored in the pond for the last 30 years because we didn’t have a waste route for them.

“Priorities have changed and we’re now working hard to empty the pond of its legacy contents, as part of our commitment to bring forward the pond de-watering and accelerate decommissioning of the plant.”

Photograph:

Left, one of the masts is lifted out of the PFSP

“We’re always prepared for the unexpected - which is the joy of decommissioning old plants”

Chris Mounsey, PFSP Strategy Manager



spotlight on R&D

Collaboration supports decommissioning

A new system for remotely monitoring gamma rays is among the projects being successfully developed following the 2012 collaboration between the NDA and the Government's innovation-driving Technology Strategy Board (TSB).

The Gamma Interlock Monitor offers additional reliability over existing systems, particularly in its safe failure mode, and is the result of Sheffield-based instrumentation and systems specialist LabLogic Systems Ltd working with the University of Sheffield.

The project arose through the TSB's Knowledge Transfer Partnership (KTP) programme that enables businesses to improve competitiveness by tapping into the expertise of the academic world.

Last year, the NDA contributed funds from its R&D budget to leverage investment from TSB to a range of KTP nuclear projects to support development of the wider capability skill base in the supply chain.

Realising the nature of faults and their causes in current monitor systems can

prove difficult and time-consuming. The prototype monitor in development by LabLogic Systems Ltd and the University of Sheffield is designed to provide a visual warning at the time of a fault occurring, allowing the operator to respond immediately to the problem and carry out any necessary maintenance. This is an improvement where systems may not currently have an inbuilt fault detection or warning system.

The proposed design conforms to the high-specification standards required by nuclear site licensees and the relevant Safety Integrity Level (SIL). However, further development and full-scale trials are required before deployment at a site, together with a design review by expert user groups.

Jack Hardy, the NDA's research manager linked with the project, said: "The delivery of LabLogic's KTP project demonstrates the mutual benefits for both academic and commercial organisations in collaborating on technical challenges that support decommissioning. KTPs are an effective way of developing the capability skill base at a more fundamental level.

Dan Schofield, the University's associate for the KTP project, said: "The KTP has allowed me to research an area of interest within the discipline of electronic engineering while providing an invaluable link with a local business."

*Photograph:
Above, KTP Associate Dan Schofield tests the monitor's circuit board*

Distinctive look at research

An £8-9 million research programme will combine the expertise of the nuclear industry with 10 universities to focus on key decommissioning challenges and help build the next generation of nuclear experts.

The National Nuclear Laboratory (NNL), the NDA and Sellafield Ltd are collaborating, along with the Engineering & Physical Sciences Research Council (EPSRC) and the consortium of UK universities on 30 separate projects which focus on four themes: AGR, Magnox and exotic spent fuel; Plutonium oxide and fuel residues; Legacy ponds and silos wastes; Infrastructure characterisation, restoration and preservation.

The four-year programme is underpinned by a £4.9 million grant from the EPSRC, and will be carried out under the name DISTINCTIVE - Decommissioning, Immobilisation and Storage solutions for Nuclear waste Inventories - and follows an earlier successful programme known as DIAMOND. This grant will be supplemented by additional financial and in-kind support from NNL, the NDA, Sellafield Ltd and the universities.

Starting in February 2014, the work will include technology development, building fundamental knowledge and developing the next generation of subject matter experts. Those working on the projects will include a mixture of PhDs and Post-Doctoral Research Assistants (PDRAs). Each project will have an industrial supervisor from either NNL or Sellafield Ltd.

The university consortium is led by Leeds and includes Birmingham, Bristol, Imperial, Lancaster, Loughborough, Manchester, Sheffield, Strathclyde and UCL.

Register now to apply for share of £13 million R&D funding

Businesses and research organisations are being invited to pitch for a share of a £13 million investment fund that is available for nuclear research projects.

Collaboration will be one of the key requirements in a competitive selection process that is aimed at stimulating innovation and strengthening the UK's civil nuclear supply chain. The investment is aimed at all sectors of the industry including new build, existing operations and decommissioning.

The scheme is a joint initiative between the Government's Technology Strategy Board (TSB), the NDA and the Department of Energy and Climate Change (DECC), and follows a similar investment last year, which led to support for 35 projects over a four-year period.

The competition is open to all sizes of businesses and research organisations who are either already working in the nuclear sector or considering entering the market. There is a particular emphasis on encouraging proposals from Small and Medium-sized Enterprises (SMEs), either themselves or working with larger businesses.

Funding will be divided into two strands: £10 million for collaborative R&D projects and £3 million for feasibility studies.

Five key themes will be considered:

- Construction, installation and commissioning
- Operation and maintenance
- High-value manufacturing
- Decommissioning and waste management, including storage
- Open theme (e.g. includes Small Modular Reactors)

The competition opens on 17 March with a closing date for submissions of 30 April. Two brokering events are also being organised, where prospective partners can discuss concepts,

make presentations and link up to make collaborative submissions. The decommissioning event will be held at Rheged in Penrith on 12 February.

Melanie Brownridge, the NDA's Head of Research and Development, said: "This continues a collaborative drive initiated more than 18 months ago that is already delivering significant innovative technological progress. We rely on a vibrant, dynamic supply chain and are pleased to invest in future capability."

For full details of the brokering events and competition information see the TSB and NDA websites: www.innovateuk.org and www.nda.gov.uk. The relevant documents are: *Developing the civil nuclear supply chain - Collaborative R&D*: <http://goo.gl/HOKOKv>; *Developing the civil nuclear supply chain - Feasibility study*: <http://goo.gl/16YcHk>.

The first of these collaborative calls in 2012 was worth £18 million, with the funding partners comprising the TSB (£10 million), the NDA (£3 million), DECC (£3 million) and the Engineering and Physical Research Council (£2 million). The Knowledge Transfer Partnerships, funded by TSB and NDA, also formed part of that overall package, which also covered collaborative feasibility studies, R&D projects and one-off developments. Many of the projects are still under way.

Melanie added: "Our decommissioning strategy focuses very much on developing innovative technologies through collaborative working. Joint funding initiatives such as these massively increase the investment potential while bringing research partners together in the drive for progress and creative scientific thinking that is relevant to the clean-up mission."

Funds kick-start innovation

The decommissioning-specific laser-cutting equipment and the quadcopter's radiation mapping software were both developed with support from the NDA's R&D budget.

An initial investment of £1 million in 2009 into the use of high power lasers in decommissioning enabled TWI to develop the technology specifically for cutting and size reduction in the nuclear industry. With an aspiration to see the technology deployed within five years, the initial NDA investment has accelerated development and also, crucially, attracted additional funding from the Government's Technology Strategy Board (TSB). The TSB input supported a major collaborative project between TWI and OC Robotics of Bristol to combine the laser-cutting head with a lightweight robotic snake-arm that is highly manoeuvrable in confined spaces.

Similarly, an NDA investment several years ago supported work on the N-Visage software, enabling it to reach the ready-to-deploy stage and leading to the collaborative project that produced the quadcopter.

Melanie Brownridge, the NDA's Head of R&D, said: "These innovations demonstrate the value of early support for concepts that have real potential to benefit decommissioning. Our investments have leveraged additional funding, particularly via the TSB collaboration, and enabled these technologies to begin making an impact, delivering effective solutions and cost savings.

"We are particularly pleased to see the additional collaboration and funding from other sources which significantly increases the value of our initial investment. Future R&D will be based on this joint approach."

New technology flying high

Rotary unmanned aerial vehicles (UAVs) are beginning to offer huge potential for mapping radiation hotspots or making detailed visual records in areas that are too hazardous for normal workforce activities.

With its own autopilot system, the lightweight Quadcopter, less than one metre in diameter, is able to hover and manoeuvre accurately inside complex industrial spaces while simultaneously mapping radioactive hotspots.

Project RISER (Remote Intelligence Survey Equipment for Radiation) is a collaborative initiative between Cockermouth-based Createc, who developed the N-Visage radiation mapping software, aerial systems specialist Blue Bear Systems Research, from Bedfordshire and the University of Bristol's Department of Aeronautical Engineering.

The Blue Bear Quadcopter's flight management system: the SNAP autopilot and GCS, make it completely autonomous using simultaneous location mapping. Createc's radiation detection and mapping software N-Visage produces an accurate 3-D, high-definition picture of contamination distribution, quickly and safely.

Funding support was provided through the 2012 joint £18 million investment by Government organisations. See page 7.

The NDA also funded the original development of the N-Visage radiation mapping software under an earlier NDA innovation programme (Concepts).

The NDA's Head of R&D Melanie Brownridge said: "This technology is extremely versatile and can safely access places that are too contaminated, awkward or dangerous for workers, while providing detailed information in minutes. It has the potential to be safer, faster and cheaper than existing procedures, and really demonstrates the value of collaborative projects. We look forward to seeing it progress further."

Pete Rodgers, Software Engineer at Createc said: "The ability to identify radiation source locations in 3-D is very advanced and enables the RISER project to deliver safer, faster and more cost-effective solutions – while crucially minimising the potential dose for workers."

Dr Ian Cowling, Programmes Manager at Blue Bear, added: "These results provide encouragement that our innovation strategy is working with tangible benefits."

Photograph:

Below, the Quadcopter is put through its paces at a demonstration day for new technology at NNL in Workington





Close shave for cleaner skips

Hundreds of radioactive skips, once used to house spent fuel rods, could end up clean enough for conventional metal recycling if trials at Hinkley continue to exceed expectations.

The Magnox Ponds Programme Team at Hinkley Point A have found that all detectable radioactivity is removed when just 1.2mm of paint and steel is machined off the skip panels by a computer-guided precision milling machine.

Prior to this new technology, it had been assumed that, despite the best available cleaning methods, the skips would need to be treated as Intermediate Level Waste or Low Level Waste.

If milling trials continue to be successful and the process is adopted for the 500-plus skips across the Magnox fleet, cost savings could reach £30 million. Of equal significance, valuable space would be preserved in the UK's Low Level Waste Repository near Drigg in Cumbria and in the Geological Disposal Facility, which is yet to be built.

Ian Pullin, Magnox Technical Co-ordinator, said the work followed the 'lead and learn' principle established by the Magnox Optimised Decommissioning Programme, where technologies are rigorously tested at a single site before being applied elsewhere.

He added: "Various methods have been used to decontaminate skips in the

past, and we are continually assessing available technologies. One major lesson we've learned is to try and avoid generating problematic secondary waste streams, such as wet residues from water-based technology, which also require treatment and therefore add hugely to costs and timeframes.

"Milling leaves dry shavings which can be vacuumed up and easily compacted for storage and ultimate disposal without further treatment. But the real bonus is that we couldn't find any contamination following the milling process. We believe there is even potential for the equipment to be used on skips at Sellafield which contain more contamination, and on other types of metal, such as pipes."

The milling machine is an off-the-shelf model combined with a highly sophisticated computer measuring system that is proving to be extremely accurate, enabling the cutting head to be programmed to follow the complex surface contours of the skips.

Meanwhile, much more of the skip surface could be machined if protruding parts such as lifting points are removed. To achieve this, the site's shielded skip store is being prepared for installation of

newly developed laser-cutting equipment that can operate with speed, accuracy and minimal waste. The laser and its cutting tool were adapted for the nuclear industry by Cambridge-based research and technology organisation TWI Ltd. The project in which the initial developments took place received support from the NDA's R&D programme, aimed at developing innovative decommissioning technology via the supply chain.

The trials are expected to be complete by spring 2014, and will be comprehensively assessed to support deployment across the estate.

Photographs:

Above, the team show off a cleaned skip panel.

Contractors:
TKE and TWI

Support for leisure and training facilities

Industrial units in Dolgellau will be transformed into a £4.5 million training centre for young engineers, in an initiative supported by a range of stakeholders including the NDA and Magnox Ltd.



Coleg Meirion-Dwyfor launched the scheme at the end of last year, aiming to help regenerate the region's economy with a focus on skills development for the energy and infrastructure sectors.

Meirionnydd Centre for Renewable Developments (known CaMDA) is backed by the Welsh Government, Gwynedd Werdd, Snowdonia National Park and the NDA, via the Magnox Socio-Economic Scheme's contribution of more than £300,000.

Work is already under way to convert the units into a modern training facility kitted out with cutting-edge equipment and machinery, easily accessible for both young people and adult learners.

The NDA's Director of Communications Jon Phillips said: "We are committed to supporting efforts to minimise the impact of decommissioning Trawsfynydd and are delighted to be making this contribution to CaMDA."

Closer to the site, meanwhile, the NDA has also provided financial support for the £1.7 million extended facilities at Coed-y-Brenin mountain bike centre.

Opened by the Welsh Minister for Culture and Sport John Griffiths, the new state-of-the-art skills area will give beginners the chance to learn basic techniques or enable experienced riders to practice for the more extreme challenges.

The visitor centre is now almost double in size, with an extension built entirely from home-grown timber, while an additional trail also caters for disabled riders. More than 50,000 riders used the new bike trail in just three months after it opened, while the visitor centre attracted more than 77,000 visitors in the same period.

Coed-y-Brenin Forest Park is one of four outdoor activity sites known together as the Snowdonia Centre of Excellence. The £4 million is funded by the EU's

Convergence European Regional Development Fund through Visit Wales, the Welsh Government, Natural Resources Wales, Gwynedd Council, the NDA and Tourism Partnership Mid Wales.

One of the four schemes, worth £278,000, involves developing an angling centre at Trawsfynydd lake, with improved access and facilities for both anglers and other lake users. The two remaining schemes are at Glanllyn site, near Bala, where watersports facilities are being enhanced and downhill mountain bike tracks at Blaenau Ffestiniog.

Photograph:

Above, Culture and Sports Minister John Griffiths watches local biker Owain James, who works at Trawsfynydd site, in the new skills area



Generating a bit more cash for taxpayers

Four stand by generators are being sent from Dungeness to EDF's Cottam Power Station, in a deal that saves around £1 million.

The Paxman diesel generators, and ancillary equipment, are no longer needed but were used to power cooling and safety systems that would kick in if power was lost at the site.

The equipment was installed as stand by and received light use, but a comprehensive maintenance regime means it has remained a valuable asset to the electricity generation industry.

Dungeness A Site Director Paul Wilkinson said: "This is a great result for Magnox, EDF and the UK taxpayer – not only because of the revenue from the sale of the equipment, but we've also been able to avoid around £600,000

worth of work to decommission the generators."

Recycling and re-using redundant equipment is part of estate-wide initiatives to develop more environmentally sustainable solutions while saving costs and time.

Last November, Magnox and Sellafield concluded a deal to send fuel skips from Chapelcross for use in decommissioning one of the Cumbrian site's legacy ponds. See Page 5.

At Hinkley Point A, meanwhile, the 240 DC switchboard - used to supply essential back-up services during the

years of electricity generating – has been sent to Wylfa, where it will help to support future modifications to the general instrument supply system, essential for continued safe operation and defuelling.

Photograph:

Above, one of the generators is prepared for re-use

Event goes from strength to strength

Now heading for a fourth year, the joint NDA Estate Supply Chain Event is fast becoming one of the 'must attend' fixtures in the UK nuclear calendar.



With around 1,300 visitors, the 2013 event in Manchester was the busiest and most successful held so far. It may even be the largest of its kind in Europe!

The attendance of Government Minister Baroness Verma, who opened the proceedings, was warmly welcomed by organisers and delegates, who also appreciated the time she took to visit exhibition stands and hear at first-hand about contractors' experiences in decommissioning, and especially the challenges faced by smaller suppliers.

Around 200 businesses took exhibition space, alongside information stands representing the NDA, all the Site Licence Companies (SLCs), Top Tier 2 suppliers, government bodies and regeneration organisations.

The 2014 event is already in the planning stage and is likely to remain in Manchester – feedback from this year's event will be used to shape the event going forward.

Launched in 2011 as one of a series of measures to raise awareness of supplier opportunities in UK decommissioning, the event is organised jointly by the NDA and its SLCs, with a particular focus on Small and Medium-sized Enterprises (SMEs).

Among recent initiatives introduced across the estate to encourage the supply chain, and supported by all SLCs, are: simplification of contract requirements for suppliers sub-contracting at all levels, adopting a the single web-based portal (HMG's Contract Finder) to advertise tendering opportunities, establishment of national and regional steering groups for SMEs, requirement for more prompt payment of invoices, more flexible Intellectual Property terms.

At the event John Clarke, NDA Chief Executive announced a further initiative to support SMEs - the NDA Estate Mentoring Scheme. More than 30 people in the decommissioning industry have already stepped up to volunteer as mentors. The scheme will be launched in early February with a call for SMEs wishing to find a mentor.

Ron Gorham, the NDA's Head of Supply Chain Optimisation and SME Champion, said: "We were absolutely delighted that so many people were able to attend last year and equally pleased to know that the event is of real benefit to our suppliers.



"Successful decommissioning is critically dependent on vibrant, dynamic innovative businesses that can provide solutions to our many challenges. We remain committed to working with our supply chain, from the largest to the smallest players. Our aim is to improve opportunities for their involvement and address any issues that cause difficulties, where we have the influence to do so."

Photographs:

Top, the award winners gather on stage. Above, Baroness Verma addresses delegates

International focus

An international dimension was introduced to the 2013 event for the first time, with delegates attending from Bulgaria, Romania, Switzerland, France, Spain, Taiwan, the USA and Japan. Organised jointly with the Government's overseas business section, UK Trade and Investment (UKTI), a series of seminars during the afternoon focused on the wide-ranging export opportunities for UK companies.

Matt Grainger, UKTI Sector Manager for Civil Nuclear, said: "Decommissioning is one area where the UK has real world-class expertise, which will generate many opportunities for businesses to expand into overseas markets. We were pleased to have such a good international presence and are keen to participate next year."

Feedback

A feedback survey indicates that 95% of attendees agreed that the event had been a good use of their time.

- More than 80% found that greatest value was in developing contacts through the business networking opportunities.
- Almost 70% of those who attended the international seminars found the discussions useful.

Among the comments were:

"We had no idea what to expect and have been very pleased with the contacts made, which we've been able to follow up. It was good to meet and talk to so many people in the industry – we estimate we managed to interact with close to 100 people."

"One of our clients said he did not enjoy networking events, but agreed to attend. He rang me the day afterwards to advise that he was thrilled with the contacts made and now firmly believes that not only should he attend future events but next time he would like to exhibit."



Recognising our suppliers

The introduction of an awards process in 2012 has allowed the NDA and SLCs to give public recognition to businesses that excel in providing an unrivalled service.

The awards were made for innovation, collaborating with partner organisations or demonstrating an extraordinary determination to succeed. All categories are open to suppliers at all levels, from SMEs to global corporations.

The 2013 winners were:

'Extra mile' category

Winner

Hertel UK and Ireland Ltd: Hinkley Point A asbestos removal

Best Supply Chain Collaboration

Winner - Collaboration led by a small company

Unity Group led by NSG Environmental Ltd with DBD, Gardiner & Theobald, SKM Enviro with expert advice from University of Manchester and Studsvik (UK) Ltd: NDA Strategic study for programme approach to treatment of higher activity waste.

Winner - Collaboration led by a large company

Doosan Keltbray Consortium with Deborah Services and Magnox: Bradwell Boiler Houses Deplanting.

Highly commended

Interserve Industrial Services and Graham Engineering: Apprentice Exchange.

Best Example of Innovation

Winner - Small Company

Kongsberg Maritime Ltd: Design & manufacture of high-temp CCTV camera system for Dounreay Fast Reactor vessel.

Winner - Large Company

National Nuclear Laboratory: Production of test sludges for the development of the Sellafield Silos Direct Encapsulation Plant.

Highly Commended

Harry Peers Steelwork Ltd: Temporary construction access openings for Evaporator D Sellafield.

Highly Commended

PacTec EPS Ltd: Flexible packaging systems for Very Low Level Waste and Low Level Waste.

Minister's SME Award

Winner

WallRover Ltd: Continued innovation and development of WallRover technology

Highly Commended

Alex Jenkins, Decontamination Technical Specialist, of Sellafield Ltd, for being a champion of SME innovation

spotlight on Dounreay



Reactor demolition takes another step forward

A pioneering Dounreay innovation has allowed the team taking apart the Prototype Fast Reactor to complete one of the final phases ready for demolition.

The centre guide tube - which once housed the reactor's control and shut-off rods - was successfully raised from the reactor core, demonstrating that internal fixtures can be safely removed. This supports plans for taking apart the remainder of the former electricity generating plant.

The original equipment to remove and replace reactor core components was designed to operate while immersed in molten sodium at temperatures above 350°C. Now the reactor is drained of sodium and the temperature is below 100°C, this equipment no longer works.

The reactor dismantling team set to work and identified an alternative method to remove the reactor core items via existing access points.

Led by Calder Bain, who has been at

Dounreay for 50 years, a design team proposed a long grab, capable of reaching down approximately 10 metres from the reactor top to latch onto the guide tube, with a chain block connected to the building crane which carefully raised the tube from the reactor depths.

Manufacture of the extraction and sampling equipment was undertaken by local contractors and subsequently assembled and trialled at JGC's T3UK Facility.

The equipment was then transferred to the reactor where further trials were undertaken before the final lift took place.

PFR reactor dismantling project manager Rob Hibbert said: "This was a complex and technical challenge for the team and a significant achievement to carry

out the remote operations safely in a hazardous environment. During this project, readings were recorded from the depths of the reactor in excess of 1000Sv/hr, which is valuable data for carrying out the remainder of the reactor decommissioning plans."

The final reactor component extraction and characterisation will be completed during 2014.

Photograph:

Top, preparations take place to remove the centre guide tube

Contractors:

JGC Engineering and Technical Services Ltd, Precision Machining Service Ltd

FACT FILE:

- The experimental fast breeder reactor at Dounreay led British research and development of nuclear energy during the 1950s and 60s.
- Housed inside a steel sphere the reactor's 14MW output was enough to power a small town like Thurso (population of approx 9000). It closed in 1977.
- Decommissioning DFR, due for completion by 2025, is one of the most significant challenges in the UK today and is expected to cost approximately £240 million.
- The Prototype Fast Reactor (PFR) was the second and last fast reactor built in the UK, building on the success of the DFR. It had been intended as the final step before bringing fast reactors into use as conventional power stations, but by the late 1980s, the UK Government decided there was no need and shelved the programme.
- The PFR, which also incorporated fuel research and development, closed in 1994 and is scheduled to be fully decommissioned by 2024, with a total cost of around £338 million.

Pond trials continue

The two ponds at Dounreay's Fast Reactor (DFR) are now completely drained and trials are taking place to establish the best method of removing the contaminated concrete liner.

The two six-metre deep concrete chambers have been emptied of all contaminated water, sludge, redundant furniture and debris, leaving the radioactive concrete exposed.

Trials are being carried out at the T3UK off-site testing facility in nearby Janetstown where replica reinforced concrete wall sections have been erected.

Phase 1 of demonstration trials and operator training is now complete, with lessons learned and a review being undertaken of knowledge gained. Additional trials and training are due to be complete before the end of the year.

The method involves removal of concrete blocks using a drilling rig with a rotating diamond wheel high-frequency cutting saw attached to a rotating plate, enabling both horizontal and vertical cutting. The 'drive' procedure is controlled remotely.

DFR project manager for pond decommissioning Aly Mackay said: "The trials are required to demonstrate the effectiveness of this bespoke method and more crucially to ensure the equipment is intrinsically safe. All key safety functions must be robust and operate safely in a highly hazardous environment."

Bespoke quick-erection scaffolding has been selected for access to the pond structures and is being trialled in the T3 trials hall.

The project team are also using an innovative shielding system to reduce dose rates in the pond structures. This is basically the use of large plastic blocks filled with water and assembled in a Lego-type fashion. This shielding has been partially installed in the east pond already, with both the scaffolding and shielding capable of being re-used for other decommissioning projects on site.

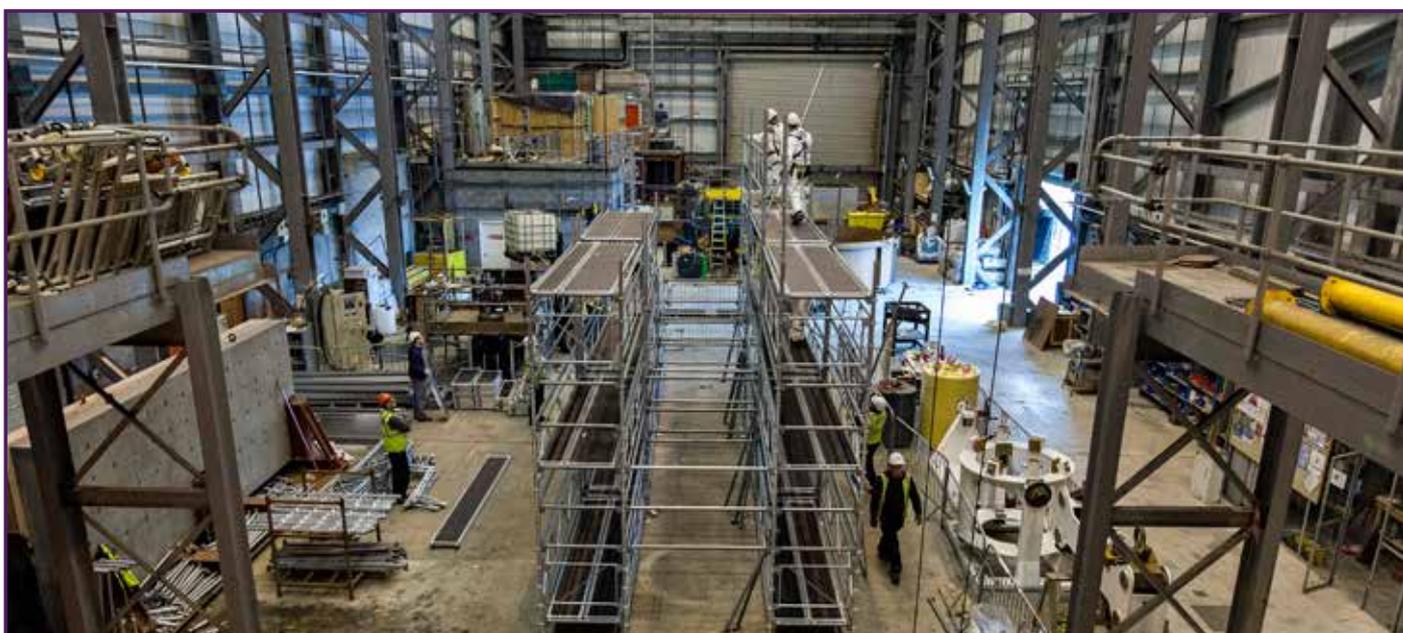
Full-scale work is scheduled to start in the pond area early next year.

Photographs:

Below, trials are under way

Contractors:

ONET Technologies UK, Holemater Demtech Ltd, Turner OCTO System Scaffolding, JGC Engineering and Technical Services





Dounreay's latest crush

The crushing of drums containing low level waste is set to resume at Dounreay after a replacement was found for a key machine that suffered a major mechanical failure in 2011.

When it became apparent that the original drum-crusher, or supercompactor, housed in the Waste Receipt, Assay, Characterisation and Supercompaction plant (WRACS), could not be repaired, a brand new one was found at AWE. Surplus to AWE requirements, it will save both time and money.

The new supercompactor has now arrived on site and is now being installed.

A backlog of 11,000 drums has built up in the meantime, all requiring compaction into much smaller 'pucks' before being stacked in containers and transferred to the new Low Level Waste vaults.

Two cranes lifted the 45-tonne drum-crusher up and delivered it into the building through the roof hatch, with operators and contractors inside waiting to guide it to its final position.

Dounreay Site Restoration Ltd Project Manager Graham Beaven said: "We used the containment that housed the old supercompactor to demonstrate the principle of low level waste disposal in bulk for the first time," he said. "That unit is now awaiting disposal in the new low level waste vaults."

The WRACS team, who have been working to assay and characterise the LLW drums while the supercompactor was out of action, are expecting to restart operations by April and will be working in shifts until the backlog is cleared.



Photographs:

Left and right, equipment is lifted into place

Troublesome tank contained at last

One of the most challenging and problematic legacy hazards at Trawsfynydd has now been successfully decommissioned.



The highest level of alpha contamination ever encountered on site was in the 'RB Tank', a vessel used for sludge filtering and drying. Named after the late Trawsfynydd engineer Robert Byron Jones, who was involved in the initial design, the vessel was a legacy of the site's electricity generation era.

Such a challenging environment led to the development of an innovative approach that mirrors a technique currently being adopted for the Chernobyl reactor – albeit on a much smaller scale.

The vessel was contained with Nuvia's modular-containment system Moducon®, a glass-fibre panel structure mounted in a steel support framework which was designed and constructed specifically for the project, but which Magnox can now reuse for future C4 (very high level of contamination) projects. Nuvia's parent company VINCI is working to construct the containment structure on the Chernobyl plant.

A sectional rail system was designed so the partially constructed Moducon

containment system could be put together in a low-radiation area and be pushed into position over the tank - minimising both dose uptake and the risk of contamination.

Once the containment was in place, the team made numerous entries in to the C4 ventilated environment using air-fed suits to size-reduce the tank, vacuum any ILW waste, categorise and segregate the material, allowing packaging and consignment to appropriate disposal routes.

The major hazard reduction milestone is an important step on the road towards achieving the Care and Maintenance stage in 2016.

The success results from a small team of Magnox and Nuvia engineers working collaboratively. Numerous technical challenges arose along the way, but by working together to develop an innovative solution, the project was delivered safely, removing a major liability and leaving Magnox with a facility which will be a major help with ongoing site decommissioning.

Jason Carter, Senior Project Lead for Magnox, said: "The safe conclusion of this project is a reflection of the professionalism and perseverance of the team working in these challenging conditions. The modular system will now be retained for future projects and the site will retain its C4 capability"

Photograph:

Above, air-fed suits allowed workers to work on the tank

FACT

Alpha particles cannot travel very far and are easily shielded, even by paper or clothing, but are extremely dangerous if ingested.

Contractor:

Nuvia



Almost there for Sizewell

Sizewell A is now more than 75 per cent defueled, with the last of the 52,945 fuel elements due for dispatching to Sellafield by September.

Sizewell A Site Director Tim Watkins said: “This is a significant milestone in Sizewell A’s lifecycle. It is only six months since we were marking 50 per cent defuelled; that shows how much progress is being made now we have priority for fuel transport flasks.

“Our highly skilled teams continue to do a fantastic job, keeping the fuelling machines going and defuelling safely and efficiently.

“Removing spent fuel from reactors and transporting it to Sellafield for

reprocessing is a complex process, but Magnox is using all its experience and expertise to deal with the legacy of this first generation of nuclear power stations.

“Once all the fuel has been dispatched, we will have reduced the radiological hazard on site by more than 99 per cent.”

Dr Brian Burnett, NDA Head of Programmes for Magnox and RSRL, added: “This is a vital step in reducing hazard on the site.”

Last year, Chapelcross and Dungeness A both completed defueling. Once the last fuel element is removed from Sizewell, the only Magnox sites with fuel will be Oldbury, Wylfa – which is still generating electricity – and Calder Hall, which is operated by Sellafield Ltd.

Photograph: Above, a spent fuel flask is manoeuvred into place ready for dispatch to Sellafield



All sealed up....

This grey seal had a lucky escape from Wylfa recently when she was discovered in one of the pumphouse drumscreen chambers. Pulled along by strong currents, she had slipped through the bars at the end of the sea pipe. RSPCA inspectors were called out and she was given a clean bill of health.



RSPCA Inspector Mike Pugh said: "This kind of rescue happens from time to time and we're grateful for the vigilance of power station staff. We're really happy that this seal was unhurt by her adventure and we could return her safely to the sea."

Meanwhile, waste wood from felled trees at Oldbury has been re-used to construct an otter holt under the guidance of Kate

Baxter from the site's environment team. The trees were felled after a drainage survey concluded their roots were affecting local services.

Kate said: "The Magnox ecologist Graeme McLaren and I saw otter tracks in the Lagoon Three area of the site earlier in the year, so we focused on improving otter habitats."

*Photographs:
Main picture: Wylfa grey seal rescue
Above: Otter holt at Oldbury silt lagoon*