

INSIGHT

into nuclear decommissioning



Delivering progress across the UK

Contents

- 2 NDA Business Plan
- 3 £31 million for nuclear
- 4-5 Unique research boost
- 6 Students showcase work
- 7 New waste guidance
- 8 Defuelling completed
- 9 Asbestos removed
- 10-11 Progress on historic pond
- 12-13 Farewell to boilers
- 14 Site accelerates clearance
- 15 Materials on the move
- 16 Archive for Scotland
- 17 Tate nuclear
- 18 Vault emptied
- 19 Focus on SME
- 20 Action on smaller businesses
- 21 Sharing with China
- 22 Issues register
- 23 INS in focus
- 24 Sodium solution

Front cover: The Sellafield pipe-bridge is manoeuvred into place – see page 10

Welcome to the spring 2013 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

Business Plan published

The NDA has now published its 2013/14 Business Plan which sets out spending priorities for the period as it continues to focus on accelerating hazard reduction across the estate.

The focus at Sellafield will remain on driving forward further progress across the site including a programme of major projects required to decommission the high hazard legacy ponds and silos, while also working towards the completion of the contracts at both the Magnox and THORP reprocessing plants by the end of the decade.

Key activities across the rest of the estate in 2013/14 will include the selection of a new owner of the contract to operate the 12 Magnox and Research Site Restoration Limited (RSRL) sites. Defuelling will continue at Oldbury and Sizewell A, with electricity generation continuing at Wylfa. An accelerated programme of decommissioning and demolition activities will continue at Bradwell and Trawsfynydd in preparation for the sites to be placed into the care and maintenance phase in 2015 and 2016 respectively.

The NDA will spend a total of £3.2 billion during the next financial year with 55% targeted at Sellafield.

NDA chief executive John Clarke said: “Our 2013/14 Business Plan sets out a challenging year of activity as we seek to accelerate our programme to reduce hazard and deliver value for money for the taxpayer.

“Sellafield remains our number one priority, particularly ensuring the site remains safe and secure and that we are able to make demonstrable progress in tackling the high hazard legacy facilities.”

FACT FILE

Total planned expenditure for 2013/2014 is £3.2 billion, of which £2.3 billion will be funded by UK Government and £0.9 billion by income from commercial operations.

Planned expenditure on site programmes will be £3 billion, while non-site expenditure is expected to be £0.2 billion.

This non-site expenditure includes skills development, socio-economic, research and development, insurance and pension costs, fees to SLCs, implementing geological disposal and NDA operating costs.

The NDA's 2013/14 expenditure is part of a four-year budget settlement of £12 billion announced by the Government in 2010.

The search continues

On January 30, Cumbria County Council voted against moving to Stage 4 of the Managing Radioactive Waste Safely (MRWS) process, despite the area's two borough councils – Allerdale and Copeland – voting overwhelmingly to proceed. The decision means the current MRWS process has now ended in west Cumbria.

The Government has said it remains committed to deep geological disposal as the safest way to dispose of higher activity radioactive waste, in line with most other major nuclear countries. It is also still committed to the principles of voluntarism and a community-led approach, and will reflect on the west Cumbria experiences to identify what lessons can be learned.

In a statement, the NDA said: “We welcome the fact that Allerdale and Copeland councils both voted to move to Stage 4 (desk-based studies in participating areas), but we are disappointed that Cumbria County Council voted against this.

“We will work with Government and the communities to understand the reasons for the decision and learn lessons for the future.

“We will continue to support Government in the MRWS process and will work actively to ensure that the case for hosting a GDF is drawn to the attention of communities who may be interested in finding out about potentially hosting a facility.”

The NDA has also written to Site Stakeholder Groups in England and Wales, seeking their views on moving forward.

£31 million injection for nuclear research

Decommissioning research projects were among the beneficiaries when Business Secretary Vince Cable announced major collaborative funding awards that will enhance the nuclear supply chain and increase opportunities to commercialise new technologies.



The funding, provided by a range of public bodies including the NDA, will support 35 UK projects in developing new technologies for the construction, operation and decommissioning of nuclear power plants. This will bring together more than 60 organisations including Sellafield Ltd, National Nuclear Laboratory, Ceram and Costain Energy & Process. They will work alongside innovative small and medium-sized enterprises (SMEs) and universities.

The £18 million joint funding between the Technology Strategy Board (TSB), Department of Energy and Climate Change (DECC), NDA and Engineering and Physical Sciences Research Council (EPSRC) is expected to leverage in an additional £13 million, creating a total project value of £31 million.

Secretary of State for Business Vince Cable said: “There are huge global opportunities that the UK is well placed to take advantage of in the nuclear industry. Our strong research base will help develop exciting new technologies that can be commercialised here and then exported across the globe.

“The Technology Strategy Board is playing a vital role in helping UK businesses realise their potential and compete on a bigger scale. There are many innovative SMEs across the nuclear sector and this joint funding reinforces the government’s commitment to a nuclear strategy that will create jobs and growth.”

The announcement was made alongside publication of the Government’s nuclear industrial strategy.

Dr Melanie Brownridge, the NDA’s Head of Research and Development, said: “We were extremely pleased with the level of interest in decommissioning projects from both established organisations and smaller, newer businesses. Our decommissioning strategy focuses very much on developing innovative technologies through collaborative working, and joint funding initiatives such as this increase the investment potential while providing much broader opportunities for interested partners.

“We also welcome the comprehensive nature of the subject areas, covering new build as well as decommissioning, which

will enable the sharing and transfer of technologies between the different nuclear sectors.”

Chief Executive of the TSB Iain Gray said: “Delivering a new fleet of nuclear power stations to help meet the country’s energy needs involves a number of highly sophisticated and leading edge technologies. The support will help to develop capabilities in this country. That is good news for the economy because it will help us build a world-leading technology base that can provide solutions around the world.”

One of the projects to benefit is Bristol-based OC Robotics, whose award of almost £6 million is the largest-ever grant given to an SME by the TSB.

The company’s LaserSnake technology combines a snake-like robot arm with a laser cutting tool developed by Cambridge-based TWI with £1 million of NDA funding. The LaserSnake can be used under water or above ground in confined and hazardous spaces, with the potential for dismantling vessels, support structures and pipe-work.

By 2030, it is forecast that globally there will be £930 billion investment in building new reactors and £250 billion in decommissioning those coming off-line.

Photograph: Lasersnake

FACT FILE

The total funding was: £10 million from the TSB, £3 million from DECC, £3 million from NDA, £2 million from EPSRC.

- £10.9 million between 16 large-scale R&D nuclear projects co-funded by TSB (£5.7 million), DECC (£2 million), NDA (£1.2 million) and EPSRC (£2 million).
- £5.8 million for OC Robotics to develop LaserSnake, co-funded by TSB (£4 million), DECC (£1 million) and NDA (£1 million).
- £900,000 for nine new nuclear-related Knowledge Transport Partnerships (KTPs) between businesses and universities, co-funded by the TSB (£450,000) and NDA (£450,000).
- £700,000 shared between 10 projects for technology feasibility studies, co-funded by TSB (£363,000) and NDA (£345,000).

spotlight on R&D



A lap of the equator (and more) in the blink of an eye

The Large Hadron Collider at CERN has generated huge global interest and raised the profile of particle accelerators, which help physicists to study the nature of matter and energy. Less well known is that West Cumbria has its very own accelerator, the £3 million Pelletron, dedicated to nuclear research.

Recently installed in the showcase Dalton Cumbrian Facility (DCF), at Westlakes Science & Technology Park, the Pelletron provides UK universities with a unique opportunity to carry out research that will increase understanding of how materials will behave when exposed to radiation. Although of major importance to the nuclear industry, it is also vital knowledge required for other areas, including space missions and medical sciences.

Built in the US by National Electrostatics Corporation, the Pelletron generates an electrical potential of five million volts and then uses this to accelerate positively charged particles down one of six beam lines towards a target material housed in an experimental rig.

The system can deliver a wide range of positively charged particles at varying energies, ideal for research purposes. As an example, protons, the nuclei of hydrogen atoms, are accelerated by the Pelletron to a speed of around 28,000

miles per second – equivalent to a lap of the equator plus a trip across the Atlantic Ocean in the blink of an eye.

The aim is to replicate the damage caused to materials that are exposed to ionising radiation, but in far shorter timescales than a normal operating environment. This way, understanding of how the damage occurs can be developed at an early stage and future behaviour modelled in great detail.

The Pelletron is a unique research capability in the UK and its installation marks completion of the initial fitting-out of the £20 million DCF, which was constructed through a joint investment between the NDA and The University of Manchester's Dalton Nuclear Institute.

The University has placed an order for a second accelerator to be housed at the DCF that will establish, in West Cumbria, the highest energy dual-beam accelerator system anywhere in the world.

Additional irradiation capability at the DCF includes a self-shielded 812 Cobalt 60 gamma irradiator, allowing materials to be safely exposed to a wide range of different dose rates in a controlled research environment. Built by Foss Therapy Services of the US, the irradiator, incorporating around eight tonnes of lead shielding, is the first of its kind anywhere in the world.

DCF's Commercial Director Kevin Warren, who spent 25 years in the nuclear industry before joining the University, said: "The UK has invested less in nuclear R&D over the last 20 years or so than countries like South Korea, India and France. It is essential that the UK invests further in nuclear R&D to underpin its energy policy which features a strong commitment to nuclear energy. With DCF, we are bringing high-end pure academic research into West Cumbria, providing a world-leading user facility that is also open to universities across the world."



“DCF is already a world-class facility and the Pelletron is, effectively, the icing on the cake that will bring a unique advantage to further enhance our research capabilities. We are thrilled to have such a centre of excellence in west Cumbria, and look forward to seeing how the research outcomes can be applied to the many challenges of decommissioning and waste management.”

Dr Melanie Brownridge, the NDA's Head of Research



Among the other features at DCF are a wide range of more conventional top-of-the-range experimental facilities such as high powered computer modelling capability, and high-end analytical and post-irradiation examination labs. In all, the West Cumbrian site offers unrivalled world-class research facilities designed to attract interest from UK and overseas universities and industry.

The DCF was an important element in the decision to award the Diamond Jubilee Queen's Anniversary Prize to The University of Manchester's Dalton Nuclear Institute in recognition of its research and higher learning.

No other UK university is able to offer such a comprehensive cutting-edge pure research environment for radiation science and decommissioning, and the aim is to fully exploit its potential.

Collaborative work between different academic institutions and the availability of cutting-edge facilities will help to re-position the country at the forefront of international nuclear research, a key aim of the Government whose House of Lords Committee last year recommended that more was needed to strengthen UK nuclear R&D capability.

The Director of the DCF, Professor Simon Pimblott, has already hosted a workshop starting the process to establish a collaborative network of academic expertise in radiation science, attracting delegates from 13 UK and overseas universities.

The NDA and The University of Manchester maintain a collaboration agreement that supports UK academics accessing the Central Laboratory, the UK's £250 million R&D complex at Sellafield, which is managed by the National Nuclear Laboratory. Manchester has already placed researchers in Central Laboratory, providing an outstanding opportunity for students to work alongside industry experts. The University of Liverpool has now completed the process to enable its students to access the Central Laboratory, with other universities also interested.

Currently, the University has 14 post-graduate students and seven academic positions based at the DCF and is progressing towards a full complement of around 40 on-site personnel. The investment in DCF by NDA and The University of Manchester's Dalton Nuclear Institute supports key academic capability in nuclear decommissioning and forms a key component of the Britain's Energy Coast Programme. Britain's Energy Coast Programme was launched in 2005 to build on the region's existing strengths in the nuclear sector and to help transform the local economy.

Photographs:

Above left, the cylindrical Pelletron is a unique asset for nuclear research. Top, the DCF brings high-end research to west Cumbria

Vacancies for PhD students

The Dalton Cumbrian Facility and Central Laboratory will be the base for a number of post-graduate research studentships from The University of Manchester. Use of the world-class facilities is on offer to PhD or EngD students with interests in areas such as radiation chemistry and physics, materials science and radio-biology.

Positions currently available include:

- Characterisation of contaminated materials and decontamination effluent relevant to nuclear decommissioning projects.
- Dissolution and reactivity of nitride fuels in high temperature molten salts for reprocessing.
- The electrochemical breakdown of radioactive organic waste.
- Effects of radiation, particularly alpha radiation, on nuclear reprocessing process safety and performance.
- Radiation effects on process at water-metal interfaces in nuclear power systems.

Further information on postgraduate study at The University of Manchester from: www.manchester.ac.uk/postgraduate/howtoapply

Information on specific opportunities at the DCF from: www.dalton.manchester.ac.uk/discover/daltoncumbrianfacility/student/forstudents/

Students showcase their research

Research students supported by NDA funding were given the opportunity to showcase their work at the first-ever NDA PhD Seminar.



At the inaugural event in Manchester, 30 PhD students from universities across the country showcased their research to representatives from the NDA, the NDA's Site Licence Companies, nuclear regulators, nuclear R&D companies and leading UK academics.

The research showcase covered the full range of NDA's R&D needs from fundamental nuclear physics experiments to the chemical preparation of new selective adsorbents for the clean-up of contaminated water.

The students have received funding from the NDA's Bursary Scheme, which awards £500,000 annually to train the next generation of nuclear decommissioning experts.

The Manchester seminar, organised for the NDA by the National Nuclear Laboratory, was aimed at fostering collaboration between the students and sharing the ongoing research work with organisations looking to either recruit researchers or directly benefit from the results.

Dr Darrell Morris, NDA Research Manager, said: "University-based research forms a key component of our research and skills programme. It was wonderful to see how enthusiastic the students were about their research and opportunities for working in the nuclear decommissioning industry. We're already being asked when the next event will be."

Photograph: PhD students gathered in Manchester to share their research

Collaborating on research

The NDA has joined the Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC), a collaboration of academic and industrial partners from across the manufacturing supply chain.

Established in 2009 and led by the Universities of Sheffield and Manchester, Nuclear AMRC is committed to helping ensure that UK manufacturing businesses are at the forefront in the highly competitive global market for nuclear contracts.

The Government and industry-backed AMRC has more than 40 member companies, ranging from international corporations to small businesses, and is based at a top-of-the-range research factory in Sheffield, plus laboratory facilities in Manchester's Dalton Nuclear Institute. Industrialists take the lead on the direction of research, working closely with academic partners to develop technologies that address on-the-ground challenges.

Dr Melanie Brownridge, the NDA's Head of Research, said: "This partnership will support the NDA estate and its supply chain in accessing the latest manufacturing technologies to ensure that innovation is focused precisely where it is needed. It will assist them in developing world-class, high-quality solutions to the challenge of decommissioning the UK's nuclear legacy."

New guidance on managing waste

New guidance has been published by the NDA to assist SLCs and the wider nuclear industry in developing comprehensive strategies for dealing with all types of waste.

The aim of the Specification and Guidance on the Content and Format of an Integrated Waste Strategy (IWS) is to promote a more open, transparent description of how waste is managed, to secure improvements in treatment and disposal routes, and to encourage more effective ways of working.

The scope and content of the specification began to take shape following a 2011 workshop organised by the Office for Nuclear Regulation in Manchester, and attended by a wide range of stakeholders.

The new specification emphasises the importance of the ‘waste hierarchy’ which aims to increase levels of recycling and re-use, with disposal as the last option. It also is clearer about the inclusion of non-radioactive waste in Integrated Waste Strategies developed at SLC or site level, pointing out that there are benefits in considering all wastes together, rather than looking at a particular waste in isolation.

‘Waste’ covers a wide range of material including building rubble and hazardous substances such as oil or asbestos. Decommissioning sites generate waste containing varying levels of radioactivity, which is an important consideration for developing a waste strategy. Only a tiny fraction will be highly radioactive, but all of it must be appropriately sorted, processed, treated, packaged, stored and eventually sent for disposal.

The 20-page document replaces and updates lengthy, detailed specifications published six years ago. Much briefer and less prescriptive than the previous document, the new IWS Specification was developed over 18 months, led by an NDA team, following consultations with stakeholders and, in particular, the regulators.

Despite being briefer, the specification ensures that strategies drawn up by individual SLCs and sites are comprehensive, robust and take account of future developments. For



nuclear licensed sites, the development of an Integrated Waste Strategy is a fundamental part of meeting the requirements of regulators.

NDA Strategy Implementation Manager Matthew Clark said: “Essentially, the old guidance is out of date, as well as resulting in detailed and weighty Integrated Waste Strategies. The new specification provides a template for more accessible Integrated Waste Strategies that should be useful to anyone who is interested in how waste is managed. The specification will bring a level of consistency and integration to waste planning, while operators will also develop action plans clearly setting out how they will manage waste in the future.”

A launch event in Penrith, chaired by NDA Head of Integrated Waste James McKinney, was attended by around 30 delegates from the regulators, SLCs, Department of Energy and Climate Change (DECC), defence establishments and operational nuclear plants.

Representatives from the Office for Nuclear Regulation, Environment Agency and Scottish Environmental Protection Agency all welcomed the new IWS specification, as providing a succinct, flexible framework that was much more user-friendly and accessible than its predecessor. It will sit within a range of regulatory guidance and policy documents on waste management.

Magnox representative Emma Sales told delegates at the event that the new streamlined Magnox IWS replaced a myriad of previous documents and had brought clarity to waste action plans, avoided duplication of information, reduced the potential for errors and enabled the communication of clearer messages.

The guidance can be found on the NDA website: www.nda.gov.uk

Photograph: All types of waste are covered by the new specification

spotlight on Chapelcross



Last fuel leaves Chapelcross

The last consignment of spent nuclear fuel has left Chapelcross site for reprocessing at Sellafield, marking the end of a four-year programme to deal with more than 38,000 individual fuel elements.

The achievement means that 99% of radioactivity has been removed from Scotland's oldest nuclear power plant following its closure in 2004.

And thanks to innovations inspired by the British Cycling Team's 'Marginal Gains Concept', the workforce also hit the target defuelling date four months ahead of schedule.

Following verification work over the next few months, the site will be declared completely free of fuel for the first time in more than 50 years.

Mark Lesinski, NDA Chief Operating Officer, said: "This is a huge achievement for Chapelcross and for the decommissioning and clean-up programme in the UK. I have been extremely impressed by the energy and commitment with which Magnox has

risen to the challenge and I pay tribute to the site's workforce."

Since generation ended, various decommissioning work has been undertaken at Chapelcross – including the high-profile demolition of the landmark cooling towers in 2007.

Before defuelling could get under way, major work was needed, including the design, manufacture, installation and commissioning of a £30 million upgrade to the plant. Following formal permission to start defuelling from the Office for Nuclear Regulation (ONR) in 2008, the first flask of fuel left the site in April 2009, and over the next four years 38,075 fuel elements in 257 flask shipments were systematically and safely removed from the four reactors.

The site was originally set a target to complete defuelling by June 2013, however, the NDA, which owns Chapelcross, challenged Magnox to safely removing all the spent fuel by March 2013, encouraging faster hazard reduction. To meet this target, an innovative approach – based on the 'Marginal Gains Concept' – was implemented across defuelling operations, and the revised, more challenging target was beaten by six weeks.

Once fuel-free status is verified in the next few months, Chapelcross will move to a post-defuelling structure, as work continues on various decommissioning projects until the site enters interim care and maintenance in 2017.

Photograph: The defuelling team bid farewell to the last flask

Bulk asbestos safely removed

More than 10 years' worth of work to remove 2,100-plus tonnes of asbestos from Hinkley Point A site has now been completed.

Asbestos, widely used as a construction material during the 1950s-60s, was the largest non-radiological hazard on the site. The project to strip, process and then safely dispose of the material has been a major priority for the Somerset site, which started generating electricity in 1965.

Site Director Lee Talbot said: "During construction, the full dangers associated with asbestos were unknown and its use was widespread. It's been a huge task to methodically clear the site of this historic hazard but we are extremely pleased to have reached a safe conclusion to this milestone project.

"The removal of the asbestos from Hinkley Point A is another significant step towards our goal of decommissioning the site."

Almost 400 tonnes were removed from the turbine hall alone, equivalent in weight to more than six Boeing 787 aircraft - showing the sheer size and scale of the project.

Working closely with specialist contractors, Magnox has pioneered a number of innovative approaches to dealing with the waste, reducing the cost of disposal and saving more than £600,000 for the UK taxpayer.

Compaction and careful monitoring of the asbestos - to demonstrate that it is free from radioactive contamination - has enabled Magnox to dispose of some material through conventional disposal routes including licensed special waste landfill sites. This avoids using the UK's Low Level Waste Repository near Drigg in Cumbria, which is expensive and has limited space.

Photographs:

Above right, super-compaction of the drums was introduced.

Right, removing the asbestos has taken more than 10 years



Contractors:
Hertel and Kitsons

spotlight on Sellafield



Landmark achievement as historic pond prepares to give up its sludge

Sellafield workers have achieved a major step towards completing one of the biggest challenges in UK nuclear decommissioning.

After building one of the world's largest mobile cranes, workers have installed a 30-metre pipe-bridge that, for the first time, allows radioactive sludge to be removed from one of the site's historic open-air ponds and transferred to a treatment plant.

The First Generation Magnox Storage Pond (FGMSP), built in the 1950s-60s to store nuclear fuel before reprocessing, is one of the four high hazard Sellafield facilities prioritised for clean-up.

The pipe-bridge is vital to the mission, connecting the pond to the new Sludge Packaging Plant where the sludge, once transferred, will be stored before being immobilised in boxes for long-term storage.

The focus can then switch to retrieving fuel from the pond, scheduled to begin in 2015/16.

Installing the 50-tonne pipe-bridge posed a series of huge challenges.

The pond contains contaminated water and is located in an extremely congested area of the site, meaning major construction projects are fraught with risk and logistical headaches.

Project manager Steve Harnwell said: "Many said it couldn't be done but we proved them wrong; failure wasn't an option.

"The job involved convincing ourselves, the safety experts and the regulators that we could safely build one of the world's largest mobile cranes in the heart of the Sellafield site.

"Just finding enough space between the buildings was a challenge, never mind lifting the pipe-bridge over the top of neighbouring nuclear facilities.

"It was a mammoth task, carried out with an enormous crane, which had to be executed with surgical precision. Prior to the actual lift, we had a dummy run

off-site to check that the whole lifting operation could physically be done."

Mark Steele, Head of Programme, Sellafield, for the NDA, said: "This project just underlines the huge challenges and complexities involved in cleaning up the historic high hazard areas of Sellafield.

"The innovation and determination of the team proves what world-class talent we have carrying out this vital mission in west Cumbria.

"Assembling the pipe-bridge off-site has saved significant work on site and allowed the task to be completed 18 months earlier than scheduled."

Photograph: The pipe-bridge is moved into place

"Many said it couldn't be done but we proved them wrong"

Project Manager Steve Harnwell

Contractors:
AKTiv joint venture,
with Atkins, Carillion
and Jacobs

Critical crane back from the grave

A massive, specially designed crane that was once condemned as unfit for use has been brought back into service following a painstaking and complex refurbishment lasting many years.



The 60-tonne crane, known as the skip handler, straddles the First Generation Magnox Storage Pond (FGMSP) and is used to move skips of spent fuel, waste and equipment around the open-air pond. It is also a critical element in the programme to retrieve and treat the pond's radioactive contents.

Now fully operational for the first time since the 1990s, the refurbishment involved scores of specialist engineers, working to develop a range of innovative solutions.

Jim French, NMP Executive Director for Sellafield Ltd, Decommissioning, said: "I'm immensely proud of the workforce. The skip handler was in such a poor state from under-investment that it was actually condemned in 2002 and bringing it back into service will have a massive impact on the decommissioning programme."

Now that the skip handler is operational again, the first job was to move four skips to demonstrate capability and reduce risk in the FGMSP.

Refurbishment of the supporting steelwork and rails for the skip handler to run on took two years and involved over 300 workers. This involved working

at height over the pond, often in poor weather and with significant radiation levels to contend with.

A complete new control system was also installed in the original machine and new, enhanced tooling was designed and manufactured for the skip handler. This will mean that fuel skips can be retrieved and relocated, and fuel and sludge can start to be retrieved from the storage pond.

Dave Skilbeck, Head of FGMSP Operations, said: "Next steps are to create enough space to install the equipment to retrieve radioactive sludge from the pond floor. The recently installed pipe-bridge will transfer sludge to the Sludge Packaging Plant 1 (SPP1), which when complete will store the retrieved sludge. The plan is to start sludge retrieval at the end of 2014.

"In parallel we're using a Remotely Operated Vehicle, like a mini-submarine, to pick up fuel and consolidate fuel skips in preparation for the retrieval of fuel. We have over 1,200 skips in the pond, space is tight and pond water visibility can be poor, so we've got quite a challenge, but we're totally committed."

First Generation Magnox Storage Pond (FGMSP)

- The FGMSP was constructed in the 1950s to store, cool and prepare Magnox fuel for reprocessing. During its 26-year operating lifetime, it processed approximately 27,000 tonnes of fuel (almost 2.5 million fuel rods). Spent nuclear fuel from the UK's Magnox stations, plus Magnox fuel from Italy and Japan, was held in the FGMSP.
- The 1950s original facility comprised an inlet building for incoming fuel, an open air storage pond, a building containing wet bays for fuel cladding removal and a sludge settling pond. The 1960s extension provided additional pond storage capacity and new large caves for improved fuel cladding removal.
- Since 1992 the plant has been in the Post-Operational Clean Out (POCO) phase of decommissioning. Considerable work has been carried out improving the condition of the building, installing new equipment and removing redundant facilities to allow the safe retrieval of the nuclear materials.
- The pond holds some 14,000 cubic metres of contaminated water, storing Magnox spent nuclear fuel, radioactive sludges, miscellaneous nuclear wastes and skips. The plan is to progressively retrieve and treat the radiological inventory, reducing the ongoing risk posed by its storage and then reducing the hazard posed by the materials.

Photograph:

The skip handler has been completely refurbished

spotlight on Berkeley



Berkeley waves off the last boilers

The town of Berkeley in Gloucestershire came to a standstill for the final time when the last two massive boilers were removed from the nearby nuclear site to be shipped off for recycling.

The first five boilers, removed a year ago, have now been smelted in Sweden, with up to 95% of the metal recycled for re-use. A further eight boilers were transported earlier this year.

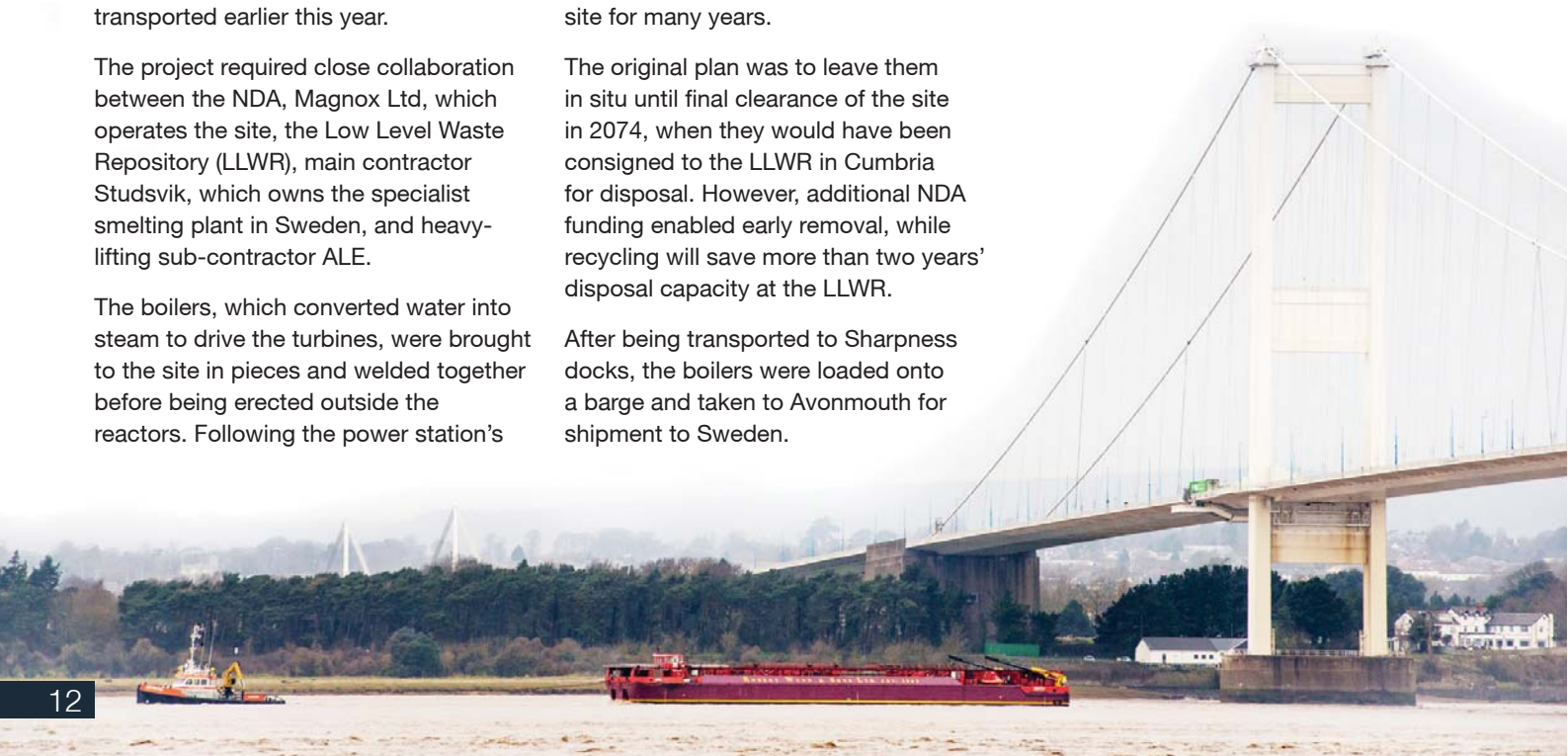
The project required close collaboration between the NDA, Magnox Ltd, which operates the site, the Low Level Waste Repository (LLWR), main contractor Studsvik, which owns the specialist smelting plant in Sweden, and heavy-lifting sub-contractor ALE.

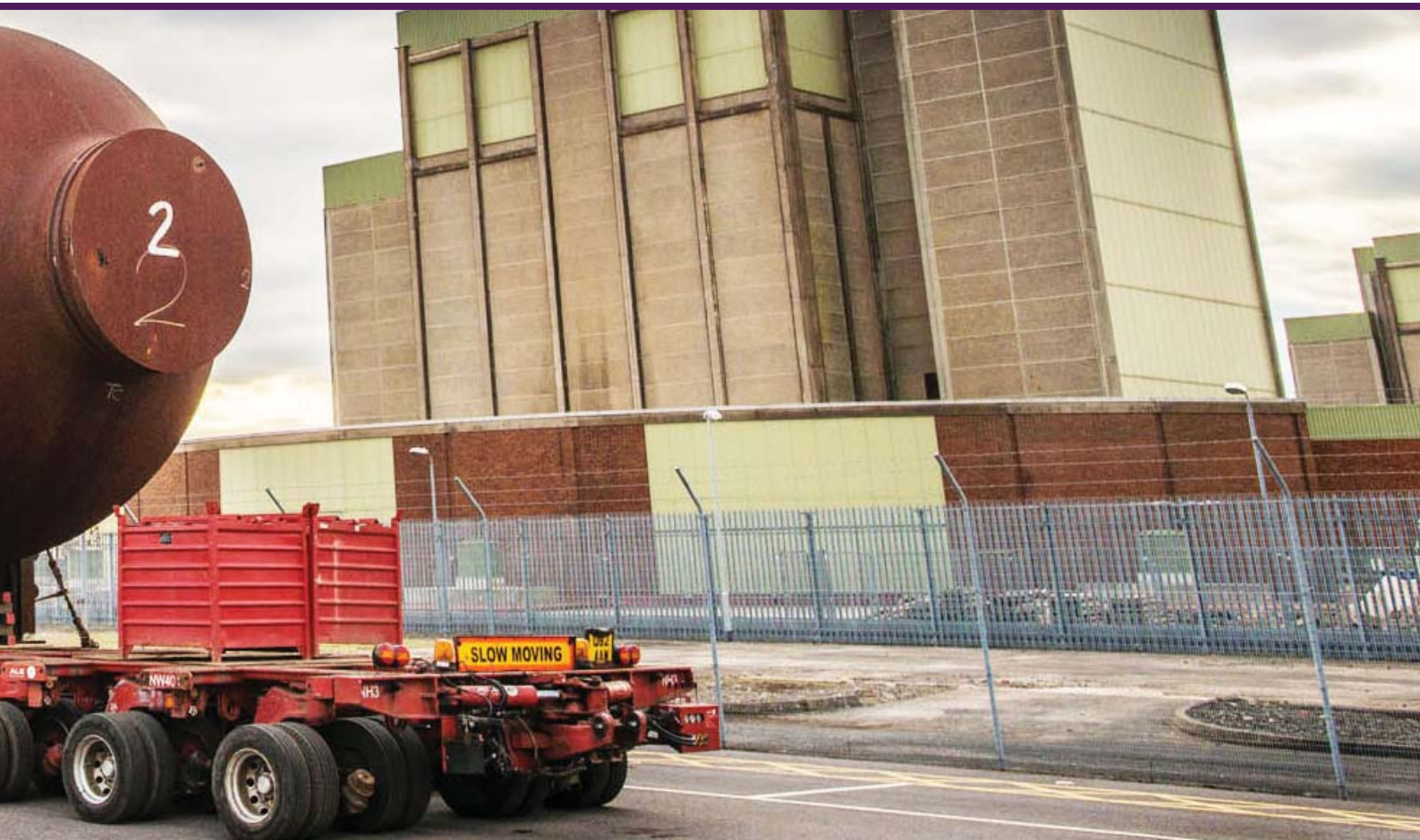
The boilers, which converted water into steam to drive the turbines, were brought to the site in pieces and welded together before being erected outside the reactors. Following the power station's

closure in 1992, the boilers – each weighing more than 25 London buses – were laid down outside the reactor buildings, dominating views around the site for many years.

The original plan was to leave them in situ until final clearance of the site in 2074, when they would have been consigned to the LLWR in Cumbria for disposal. However, additional NDA funding enabled early removal, while recycling will save more than two years' disposal capacity at the LLWR.

After being transported to Sharpness docks, the boilers were loaded onto a barge and taken to Avonmouth for shipment to Sweden.





“Recycling thousands of tonnes of metal is great for the environment, while the project itself was a fantastic example of collaborative working”

Brian Burnett, NDA Head of Programme, Magnox and RSRL



Funding boost speeds up demolition

A funding boost of more than £12.8 million will speed up decommissioning at Dungeness A, enabling the turbine halls to be demolished.

The funding has been made available by the NDA through estate-wide efficiency savings and through re-prioritisation of other work.

Clearance of the south side of the Kent site will now take three years rather than the 15 originally planned, bringing a jobs bonus to the local economy and transforming the skyline when the 26-metre tall halls are razed. The accelerated work will also, by avoiding maintenance costs to the ageing plant and the sale of scrap metal, lead to cumulative savings of £15 million compared with the current plan.

The NDA Chief Finance Officer David Batters made the announcement during a visit to see decommissioning progress first-hand and to take a look at the areas that will be cleared as a result of the

work. Visitors also included NDA Chief Executive John Clarke, NDA Head of Programmes for Magnox and RSRL Brian Burnett, and Non Executive Directors Murray Easton and Chris Fenton.

David Batters said: "The accelerated demolition work will deliver significant major savings in the long term, while demonstrating visible progress in decommissioning the site."

Dungeness Site Director Ray Jepps added: "The additional funding is

excellent news, as it enables us to complete another milestone project along the site's journey towards care and maintenance and hazard reduction.

"At its peak, the work will create an additional 70 jobs and will secure employment for a number of staff, for the duration of the project."

Photograph: Dungeness A has received extra funding to accelerate work

Contractors:
Doosan Keltbray Consortium,
Celadon (alliance comprising Hertel, KDC, NSG,
AMEC, MWH & Halcrow), Erith, Squibb/LVI Group,
Nuvia, EDS/Kitsons.

Breeder transport now under way

Nuclear material left over from Dounreay's research work in the 20th century is being returned to national fuel stocks as part of the site's clean-up and closure.



The first of approximately 90 packages containing fast reactor "breeder" material was delivered safely to Sellafield before Christmas.

The material - rods made from natural uranium that were irradiated inside the reactor to breed new plutonium fuel for power stations - belongs to the NDA. DRS, the specialist rail business owned by the NDA, is carrying out the transport. The material amounts to almost half the inventory of nuclear material at Dounreay inherited by the NDA.

The NDA decided to move the material to Sellafield following consultation on its strategy for managing the UK's inventory of nuclear materials. Sellafield has facilities to recover the fuel for its possible re-use in power stations.

The return of the breeder material to national stocks follows the removal of foreign fuel from Dounreay over the last decade.

Alex Anderson, Deputy Project Director for Fuels and Waste at site contractor Dounreay Site Restoration Ltd, said: "We have worked closely with Sellafield Sites Ltd, DRS and Magnox, which owns the containers, to implement the NDA's decision.

"Our priority throughout has been to move this material in a way that protects the public and the environment from harm at all times. We have worked closely with regulators to ensure compliance with stringent national and international safety standards governing the transport of radioactive material."

Metal bars that inspired a generation

Fifty years ago, it was the fuel that gave a nation hope of limitless supplies of electricity.

Bars of natural uranium installed around the core of the experimental fast reactor where they could "breed" a new source of energy - plutonium.

The first crop was harvested at DFR in the 1960s. Thirty tonnes went to Sellafield by 1972 to recover the material for re-use.

The remainder - some 44 tonnes - is still at Dounreay.

Fast reactors went out of fashion in the 1980s, but the fuel produced by the early models at Dounreay did add to the nation's stock of nuclear fuel.

In 2011, the NDA decided the rest of the breeder will be reprocessed at Sellafield as well.

Over the next four or five years, it will be transported in small quantities by road and rail to Sellafield.

Meanwhile, the NDA has also announced its intention to transfer Dounreay's remaining nuclear materials, known as 'exotics', to Sellafield.

Comprising around 26 tonnes, the exotics date from the early days of experimental reactors and include both unirradiated and irradiated fuel or materials.

The decision to transfer the materials to Sellafield follows a period of stakeholder engagement and an options study. Subject to various approvals and agreement on transport arrangements, the first moves are likely to start in 2014/15.

Photograph:

The railhead at Georgemas has been adapted to take the material

Nuclear history captured for posterity

More than 70 years worth of information from the UK civil nuclear industry will be brought together at a new archive that will be built in the far north of Scotland.

Located near Wick Airport and due to open in 2016/17, the archive will be accessible electronically, via a comprehensive website, as well as open to visiting researchers, students and members of the public.

A vast number of records, plans, photographs, drawings and other important information and data, some dating back to the Second World War, is currently stored in numerous locations around the country.

The NDA sites hold some of the material in buildings scheduled for demolition, while some is also stored by specialist contractors in off-site locations. Sellafield, the NDA's largest site, is estimated to hold more than 50% of all the records in numerous separate stores, while at least 80,000 boxes are held in commercial storage facilities.

Little of this historic material is organised in line with the modern standards that the NDA, as a Government body, is now required to meet following legislation on maintaining public records. The NDA's Information Governance team has therefore been working on a project for seven years to develop a solution for preserving the information, ensuring it remains secure and accessible for the future.

The project was launched in association with the Kew-based National Archive which has responsibility for public records and the recent NDA's decision to proceed follows a careful re-evaluation of the options and costs in the climate of ongoing economic constraint.

Once the decision was reached to bring all the relevant material together in a single UK home, the NDA focused on the regions deemed a priority for socio-economic support, where ageing nuclear sites have long been a dominant influence in the local economy and where, therefore, site closures will have greatest local impact. Caithness, with 2,000 people working in decommissioning, was selected as the region mostly likely to benefit, as the

effective closure of Dounreay is set to become a reality by 2023-2025.

The new facility will meet all of the relevant archive standards in the UK today, with the aim of developing a base for training archivists and offering apprenticeships, linking up with the University of the Highlands and Islands, and North Highland College. Much of the information will eventually be digitised and made available for electronic research.

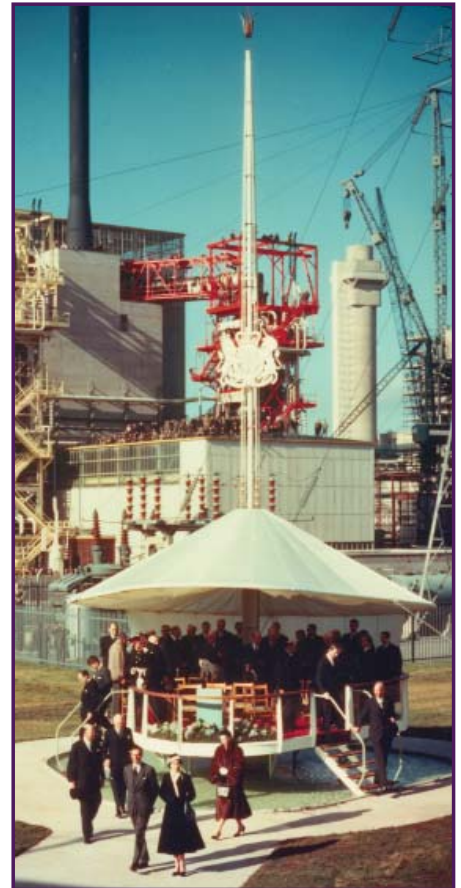
With a total project cost in excess of £20 million, the site is being developed in partnership with The Highland Council, which currently owns the land, and will at the same time provide a permanent home for the existing North Highland archive which has outgrown its current location in Wick library. The archive is a popular attraction for visitors and tourists seeking information about their Scottish heritage.

Around 20 full-time jobs will be created, while the construction phase is likely to generate dozens of temporary posts and should lead to opportunities for local contractors.

Simon Tucker, the NDA's Head of Information Governance, said: "This is an exciting project for Caithness and will create a beacon of excellence that will set the standard for information management in the nuclear industry. The partnership with the Highland Council has been instrumental in bringing this unique project forward, and I look forward to seeing the fruits of this collaboration."

Huge manpower resources will eventually be needed to sift through the material, weed out duplication and index it all, requiring guidance from subject matter experts. Wholesale digitisation, where appropriate, will also be required, while the scale of the collating task is unknown as a comprehensive audit has never been carried out across the estate.

Individual sites still have the option, meanwhile, of collecting their own historic items and artefacts to create local or regional heritage centres. There



is also potential for the Wick archive to be used for nuclear records from other organisations, such as research institutions, healthcare and existing power stations.

One of the next steps in the project will be to appoint a commercial partner, while further work is needed on the design before construction can start. It is expected that the completed facility will be ready for business in 2016.

The National Nuclear Archive project is part of a much larger programme of work to organise and manage all existing and future records across the whole estate, integrating a huge range of diverse information – stored in different formats both computerised and in hard copy – across all sites.

Photograph: Among the records at the archive will be historic images such as this one of The Queen opening Calder Hall



The art of creating a nuclear sight

The image of nuclear enjoyed an artistic make-over when Tate Britain brought video cameras to capture the sights and sounds of Trawsfynydd site in Snowdonia.

The resulting compilation, entitled *Performing Architecture*, was shared with visitors to the iconic London gallery last month as part of a film project to celebrate industrialism and modern architecture.

Trawsfynydd's buildings were designed by Sir Basil Spence (1907–1976), one of the UK's most celebrated post-war architects who was famously associated with rebuilding Coventry Cathedral. The Modernist movement of which he was part is defined by sharp, angular designs and the extensive use of concrete.

Tate Britain felt the site was an ideal place to examine architecture that no longer serves the function it was designed for.

The recording session included bouncing sound waves from walls and internal spaces, as well as extensive external photography and filming of the buildings. For more information about the artists and their visit to Trawsfynydd site click



here: <http://www.tate.org.uk/context-comment/blogs/performing-architecture-late-tate-emptyset>. The film belongs to a broader body of work looking at buildings in transition.

Dave Wilson, Trawsfynydd Site Director, said: "As part of our decommissioning strategy we are working with different

partners to preserve the cultural impact of Trawsfynydd site to make sure we leave a historical record for future generations."

Photographs:

Top, Trawsfynydd's reactors were designed by Sir Basil Spence

Above: Sights and sounds were recorded by the Tate team

Into the void ... and out again

Work is under way to decommission one of the largest and most complicated radiological hazards on Trawsfynydd site.

Located in the cooling ponds complex, the Ponds North Void (PNV) is a rectangular concrete vault, and stored sludge removed from the cooling ponds before transfer to the Main Sludge Vault (MSV).

Emptying the void is essential to enable eventual demolition of the ponds.

The PNV now contains approximately 4.75 cubic metres of liquid sludge and a variety of solid material including debris from the fuel elements (Fuel Element Debris, or FED), nimonic (nickel alloy) springs, pins and various pieces of redundant equipment.

Because of the diverse waste types and challenging operational environment, Magnox is retrieving the material with a unique, specially commissioned Rotary Deployment Arm (RDA).

A team of operators and supervisors have undergone specialist training at the equipment's US manufacturer, leaving Magnox with uniquely skilled workforce who will be share the learning across the NDA estate and wider UK nuclear industry.

The painstaking process involves filling mesh pots with a mix of FED and sludge, using the rotary arm, then washing the sludge off using a combination of supernate (already contaminated water) and 'town's water'. The process is repeated until each mesh pot is filled just with FED. The sludge in the void is then jet-washed towards a sump and transferred to the MSV.

To date 34 mesh pots have been filled and there have been 40 transfers of supernate/sludge from PNV to MSV.

Following processing, the various waste streams will be packaged and placed in the site's store for Intermediate Level Waste (ILW) or sent to the national Low Level Waste Repository.

Contractor:
SA Robotics, Colorado.

All clear for first vault

Trawsfynydd site has scored a major first for the Magnox fleet by completing the clean-out of radioactive sludge from one of its resin vaults.

The Welsh site, along with Bradwell in Essex, is one of the two Magnox 'lead and learn' sites where work is being accelerated to enable both to enter the passive Care and Maintenance (C&M) phase within the next three years. C&M will leave just the reactor buildings on site, together with a waste store, for a period of decades until the remaining structures are dismantled, the contents transferred to the Geological Disposal Facility, and the land cleared.

The three inter-linked concrete vaults were built to contain the resins that became radioactive after being used, in bead and pellet form, as a filtering agent to maintain water purity in the cooling ponds. Once spent, the ion-exchange resins formed a sludge-like liquid Intermediate Level Waste and were stored in the vaults which all need to be decontaminated, deplanted and the structures demolished.

Mark Bracegirdle, Project Lead, said: "This is another big milestone for Trawsfynydd and a key enabler in allowing the site to enter into Care and Maintenance. I am extremely proud of the project team who have worked tirelessly to deliver the project safely."

A specially designed remote-operated vehicle (ROV) was used to jet and flush

the sludge waste from Resin Vault1 (RV1) into a submerged pump system, for transfer into the main sludge vault ready for encapsulation as ILW. The ROV used a variety of tools to retrieve the sludge including a plough, high-pressure spray and wet vacuum system.

In total, five cubic metres of sludge were retrieved, which follows the recovery of all bulk resins from resin vault two (RV2) in 2012, leaving just the sludge to remove. These achievements are two major milestones for Trawsfynydd and the Magnox ILW programme.

Retrieving the waste, together with decommissioning the vaults, is a key part of the progress towards C&M and is due to be complete later this year.

Trawsfynydd is the UK's only inland civil nuclear site as well as the only decommissioning site simultaneously recovering waste from all waste streams.

Contractor:
NSG Ltd and
EnergySolutions

Photograph: At work on the resin vaults



spotlight on Supply Chain



As part of measures to support the supply chain, Insight takes a look in each edition at one of the estate's Small and Medium-sized Enterprises (SMEs)

The focus is on our people

Family-owned engineering company JGC has virtually grown up alongside the UK's nuclear industry, developing over the past 40 years from a one-man welding service into an international supplier of specialist services and equipment.

JGC was founded in Thurso by the current Chairman Jock Campbell, who began supplying welding services to the NDA's Dounreay site and the neighbouring Vulcan naval test base back in 1972.

The company has since expanded into other sectors including oil and gas, becoming more specialised in the process, and now has an annual turnover of £10 million-plus, together with a workforce of 130 people.

Its family ethos has remained, however, with three of the Campbell sons, William, Robert and John, following their father into the business, while a focus on training and skills has been a key element in the JGC story.

Director Tim O'Brien said: "We take on at least four apprentices every year and have done so for 20 years. We see staff development and expertise as key to our success. We are family-orientated, aiming to look after our people and, I hope, we retain their loyalty. We do have several generations working here together - fathers and sons, for example - and are keen to ensure that continues."

At Dounreay, JGC is currently involved with the building of the new active analysis lab that will be used to examine radioactive materials for up to 25 years, until the site reaches closure. Working as a sub-contractor in partnership with the main contractor Yorkon, JGC are manufacturing and installing the nuclear ventilation system, and providing mechanical and electrical services.

In addition to Dounreay, JGC is also working at Trawsfynydd site in Wales and Hinkley A in Devon, plus Ministry of Defence sites at Aldermaston, Devonport and Faslane. Export markets include the Far East and Europe, while two pieces of equipment have recently been despatched to Lithuania's Ignalina nuclear plant which closed in 2009.

The company's Scottish bases include a large trials and test facility, specialist manufacturing workshop and a machining plant.

Tim sees no disadvantage in being located in one of the UK's most remote corners: "It has never been a drawback, and we are often able to offer more

competitive prices because we do not have the overheads of companies based in the South East, for example."

Although active in oil, gas, renewables, utilities and general industrial engineering, JGC's background is nuclear, working at all tiers of the supply chain. Tim noted that the wide range of regulatory requirements have grown much more stringent over the years, but believes that SMEs who persist with the bureaucracy will benefit in the long term.

"Access to nuclear contracts may sometimes be influenced by a perception that the requirements are too onerous and this can act as a psychological barrier, preventing businesses, especially SMEs, from attempting to pre-qualify, but it is worth persevering - once you have done it, it becomes much more straightforward on the next tender."

Photograph:

Above: The project team inside the stack before installation

Action plan targets support for smaller businesses

The NDA has published a three-year plan to support greater opportunities for smaller businesses seeking to work in the UK's decommissioning market.

The Small and Medium Enterprises (SME) Action Plan builds on initiatives already under way across the NDA estate and meets a Government requirement for all departments to develop proposals that will help to increase the proportion of public contracts awarded to the SME community.

The NDA's plan, now approved by the Cabinet Office, sets a challenging target of 20% of annual sub-contract spend (both direct and indirect) – at least £300 million - to SMEs by 2015, almost doubling the currently reported level.

Half the NDA's current £3 billion annual budget is spent with the supply chain, via the SLCs, a figure that has grown steadily since the NDA was established. Recent analysis has, for the first time, enabled this figure to be broken down to establish the proportion reaching SMEs.

NDA Chief Executive John Clarke said: "We are very conscious that the entire supply chain is vital to our mission, and that we and our SLCs, through the supply chain, play an important role in local communities.

"Our spend is a significant proportion of DECC's budget and it will be a challenge for us, together with our SLCs and Tier 2 companies, to raise the SME proportion from the current 11% figure to hit or exceed the 20% target. We are all fully committed to ensuring that the £1.6 billion spent annually by us and our estate delivers as much value as possible to the UK economy, and, through SMEs, benefits local economies."

Ron Gorham, the NDA's Head of Supply Chain Optimisation and SME Champion, added:

"We, together with our SLCs, have already been working over the last few years to create improved opportunities for the smaller businesses and this challenging but realistic target is part of those

measures. The plan is to exceed the target in subsequent years, and continue with the initiatives now being implemented."

The Action Plan applies to all the SLCs, as well as the NDA itself and its subsidiaries. It will require NDA, SLCs and the top-level Tier 2 contractors to consider the 'SME friendliness' of procurement plans, strategies and processes.

The Government has set an aspiration that by the end of the Parliament (2015), 25% of government spend would flow to SMEs, directly and indirectly through the supply chain.

The Action Plan can be found at: <http://www.nda.gov.uk/news/sme-action-plan.cfm>

Photograph: NDA Chief Executive John Clarke



Initiatives so far

Measures now in place include:

- Simplification of the sub-contract flowdown requirements to make it less onerous for suppliers contracting in the NDA estate. The NDA requires SLCs to incorporate fairly comprehensive contract terms into all its sub-contracts - these are the 'flowdown' provisions.
- Raising the level at which flowdowns apply from £50,000 to £150,000.
- Formation of national SME steering group supported by five regional groups.
- Access to contract opportunities via the Government's Contracts Finder website as the single portal for NDA Estate opportunities.

"The entire supply chain is vital to our mission"

John Clarke

Entrepreneurs share skills with China

The unique talents of UK nuclear entrepreneurs were on show for a delegation of Chinese specialists visiting the NDA's Harwell site recently.

Based on a 'Dragons' Den' format, eight Small to Medium-sized Enterprises (SMEs) from the decommissioning supply chain were given the opportunity to make 15-minute presentations to the high-level team of nuclear decision-makers. Members of the Chinese team took on the role of Dragons, with simultaneous translation.

The SMEs were selected from more than 40 submissions to the NDA and invited to pitch their innovative ideas and expertise to the 20-strong team from China's commercial and policy sectors.

"The presentations highlighted unique and creative solutions to some difficult decommissioning challenges, and the level of innovation was hugely impressive," said Ron Gorham, NDA Head of Supply Chain Optimisation and SME Champion.

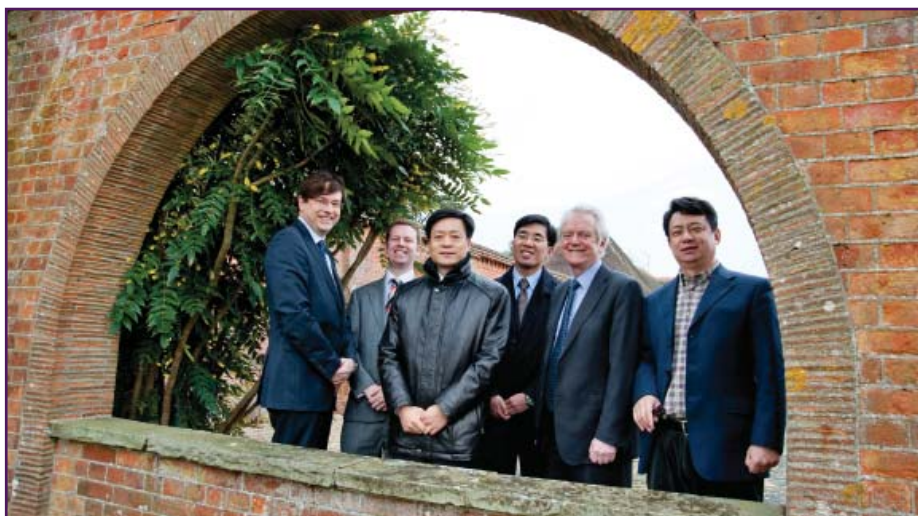
"The event gave some of our niche businesses, all offering unique products, face-to-face exposure to influential decision-makers that would otherwise have been difficult to access.

"We were delighted to be able to offer SMEs this fantastic opportunity to start the dialogue and I am confident this will contribute to helping some of the UK's smaller, highly specialised businesses to begin making progress in the Chinese market. Feedback from the event already indicates that the Chinese were very impressed by the level of capabilities in the UK," he added.

The visit was part of a five-day 'Civil Nuclear Energy Showcase UK' event organised jointly by the NDA, the Government's UK Trade and Investment (UKTI) arm and the British Embassy in Beijing.

To build on the event's success and support both the SMEs who made presentations and those who were unable to attend, a brochure will now be drafted, translated into Chinese, containing details of relevant company expertise. The brochure will form part of the follow-up exchanges.

The Chinese team included representatives from the China National Nuclear Corporation (CNNC), the China



Guangdong Nuclear Power Holding Company (CGNPC), the China Atomic Energy Authority (CAEA), the National Nuclear Safety Administration (NNSA) and the Ministry of Environmental Protection (MEP).

A tour of the Harwell site, operated by Research Sites Restoration Ltd (RSRL) also formed part of the day, with a visit to the DIDO test reactor, which closed in 1990.

The 'Civil Nuclear Energy Showcase UK' was aimed at showcasing UK's nuclear skills and giving home-grown companies – including SMEs – access to key decision-makers from China.

During the five-day programme, members of the UK and Chinese nuclear communities discussed nuclear development, waste management and decommissioning programmes.

Matthew Downing, Head of the UKTI China Energy Team from the British Embassy in Beijing, said: "The visit to Harwell provided

a valuable opportunity for the Chinese representatives to see decommissioning at first hand, meet the experts involved, ask questions and exchange views.

"They went away impressed with the expertise demonstrated, the challenges overcome and the excellent decommissioning progress being made."

Presentations were made by:

- Antech
- Quintessa Ltd
- Steve Vick International
- Centronic
- Arvia Technology
- Structure Vision Ltd
- Matom
- REACT Engineering Ltd

Photograph: Chinese delegation members with the NDA's Ron Gorham, left, Matthew Downing, second left, and NDA Head of International Relations John Mathieson

SME feedback

"This was a very valuable opportunity and we believe will greatly assist us to enter the Chinese nuclear market."

Dr John Mason, Chief Executive of ANTECH, from Oxfordshire

"Arvia has already benefited from contacts in the Chinese market, for their novel organics waste destruction technology, via the UKTI and NDA.

Pitching at the NDA's SME Chinese event was a tremendous opportunity to place our exciting waste solution in front of a high-profile audience of key decision-makers from the Chinese nuclear industry."

Martin Keighley, Chief Executive of Cheshire-based Arvia

Launch of new interactive system

The NDA's Radioactive Waste Management Directorate is making it easier for stakeholders who have raised issues about geological disposal of radioactive waste to see how their concerns are being considered and addressed through the launch of a new interactive system.

The interactive system is a huge step forward in giving stakeholders greater access to RWMD's work as part of the commitment to being open and transparent.

The search for a site to host a geological disposal facility within the Managing Radioactive Waste Safely voluntary process means that until a site is identified and the research and development programme is completed, many questions remain open at this time. Some questions can only be addressed in future stages of the MRWS site selection process.

The RWMD work programme is designed to build the knowledge base and address the outstanding questions.

The issues management process was developed to ensure that all issues raised are properly considered and where appropriate incorporated into the work programme.

Users will be able to search for the content they are interested in by topic, category or source of the issue. They will be able to view and print our response to each issue topic group.

Sam King, RWMD's Head of Disposal System Specification, explained: "We are pleased with the feedback we have received so far on our issues process and will look to take on board further feedback that improves the way in which we manage this process."

Climbing to new heights

An award-winning robot has been shared with Dounreay after undergoing trials at Sellafield.



The WallRover, a lightweight, remotely operated vehicle (ROV), that can climb walls, was developed by Dr Gary Sewell, with manufacturing partner Smith Engineering (GB) Ltd.

With the ability to carry tools such as a camera, probe or radiation-detection device, WallRover can venture into hard-to-reach spaces or contaminated areas.

Alex Jenkins, Sellafield Ltd technical specialist, has been leading the characterisation and inspection trials, which included taking concrete samples from walls using equipment mounted on the WallRover, and is now helping with demonstrations across the NDA estate.

Dounreay's Bob Kerr saw the WallRover at a cross-estate supply chain event in Lancashire last year, where it won an NDA innovation award.

"This has huge potential to accelerate characterisation projects on the Dounreay site, perform health physics surveys in normally inaccessible areas and potentially reduce working at height for inspection and characterisation activities," he said.

Bob arranged for Alex and Rodney Smith (MD of Smith Engineering) to show off the WallRover's capabilities at Dounreay.

"WallRover is highly adaptable as different tools could be mounted on it for remote operations at height on walls," added Bob.

"Use of this innovative ROV could lead to lower radiation doses for workers performing inspections and help to safely accelerate activities supporting site decommissioning."

Photograph: Rodney Smith, left, and Alex Jenkins with the WallRover



Transport moves continue

The return of solid vitrified waste to Japan has continued amid the ongoing political sensitivities around the future of the country's nuclear industry.

Despite post-Fukushima uncertainty over Japanese nuclear policy, the NDA's subsidiary INS has made two shipments in line with programme of returning overseas-owned waste to their country of origin following reprocessing at Sellafield.

The first, just four months after the tsunami, was seen as a major success in maintaining the momentum of the Vitrified Residues Return (VRR) programme which began in 2010 in such difficult circumstances for Japan's people.

However, the second departure of waste from Barrow became embroiled in the turbulence of nuclear politics and required major stakeholder management efforts, as well as transport and marine operations, between INS Japan and INS UK, working in partnership with customers and the British Embassy in Tokyo, to help navigate the situation and ensure that the ship Pacific Grebe departed successfully in early January 2013.

Future policy still remains unclear. Before last year's election, the policy was, ostensibly, to aim for a nuclear free society by the 2030s, however, new Prime Minister Abe has announced a review of that decision with a firm outcome yet to be settled upon, although they have committed to making a decision on restart of the reactors within three years.

Photograph:

The NHK film crew in action

All under the media spotlight

Keeping a close eye on the departure of Pacific Grebe was a film crew from Japan's public service broadcaster, NHK, who spent five weeks filming issues around UK nuclear decommissioning and waste management challenges.

NHK, the Japanese equivalent of the BBC, commissioned an award-winning director to explore the NDA's origins, operating model and hazard reduction programmes, as well looking at how NDA could support TEPCO in meeting the challenges at Fukushima Daiichi.

The NDA, INS and Japan have been sharing information on unconventional nuclear clean-up challenges of the kind

now facing TEPCO, a move that stems from David Cameron's visit to Japan last year, in which both the NDA and INS were involved.

The 50-minute film (unfortunately with no English subtitles) also featured Sellafield, Hunterston, Dounreay and Berkeley, and was broadcast in March to coincide with the second anniversary of the tsunami and subsequent Fukushima disaster.



Major hazard from Winfrith ... gone!

A massive batch of hazardous sodium metal, stored at Winfrith for more than 30 years, has now been disposed of.

Although non-radioactive, extreme care was needed to deal with the 25 tonnes of metal including a purpose-built processing facility and a range of additional safety measures.

The sodium was a legacy of past research projects at Winfrith, Dounreay and Hunterston in Scotland, and Cadarache in France, and was stored in a variety of packages.

NDA was able to make funding available after re-prioritising work and securing efficiencies elsewhere.

Research Sites Restoration Ltd (RSRL) Project Manager Andy Philips said: "Sodium in its elemental form is particularly dangerous in contact with water, as it reacts violently, generating a hazardous cocktail of inflammable hydrogen, heat and caustic sodium hydroxide."

After considering various options, the method selected was to size-reduce the sodium on site, before packing it into 10kg units for specialist incineration.

A purpose-built tented processing facility was constructed inside an empty building, equipped with specialist equipment and extra safety measures including sodium fire extinguishers and gas detection equipment. Work continued 24 hours a day, seven days a week.

Andy added: "A specialist sodium contractor, NDSL, undertook the processing. The steel vessels were cut open in a dry nitrogen atmosphere, the sodium removed in the tented enclosure, packed in dry nitrogen-filled bags in sealed kegs and, finally, the kegs were over-packed in steel transport drums, blanketed with dry nitrogen.

"Behind the success of this project has been an effective working collaboration between the NDA, RSRL, contractors, the parent body organisation and the regulator, culminating in the successful removal of a substantial hazard from the Winfrith site."

Fact File



- Sodium in its elemental form is highly reactive.
- A favourite demonstration in school chemistry lessons is to put a tiny piece of sodium metal into a water bath, where it fizzes and propels itself around.
- This is an amusing experiment with a gramme or two, but becomes progressively more dangerous with larger lumps.
- Above is a picture of what happens when a single kilo of sodium is added to water.
- Consider that the largest lump of sodium at Winfrith was 5,000 times bigger than this.

Photograph: Top, a tented enclosure was set up in an empty building.

Contractor:
Babcock and NDSL