

# INSIGHT

into nuclear decommissioning



**Delivering progress across the UK**

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*Front cover: Christopher and John Cockcroft were among the guests invited to witness the removal of the iconic Windscale Pile filter gallery, a safety feature fitted at the insistence of their Nobel prizewinning relative Sir John Cockcroft which proved critical when the 1957 fire broke out – full story, see page 10*

Welcome to the winter edition of our news magazine Insight, bringing you details of progress from round the estate.

If you have any comments, please contact the editor Deborah Ward on 01925 832280 or [deborah.ward@nda.gov.uk](mailto:deborah.ward@nda.gov.uk)

## “Our suppliers are vital to the mission”

John Clarke, NDA Chief Executive



## What they said:

**“It was fantastic. The quality of exhibitors and delegates in attendance was at a level very rarely seen at any event in the UK”**

Thomas Graham & Sons

**“Another superb event – the best yet”**

PacTeC EPS Ltd

**“The perfect forum for raising our business profile and it really exceeded all of our expectations”**

MechaTech Systems

**“We managed to engender quite a bit of interest in our work”**

Institute for Collaborative Working

# Supply chain event just gets busier!

This year's NDA Estate Supply Chain Event has been informally voted a huge success, attracting around 1,500 visitors who enjoyed a day of informal networking opportunities and presentations on the decommissioning sector.



Social media feedback, including Twitter and LinkedIn, carried post-event comments ranging from “superb” to “the perfect forum” and “fantastic”.

Now believed to be the largest of its kind in Europe, the Manchester event, organised jointly by the NDA and its Site Licence Companies, is aimed at creating greater visibility of opportunities for suppliers, and for Small and Medium-sized Enterprises (SMEs) in particular. For both visitors and exhibitors, entry is free of charge.

The day, themed ‘Connect and Collaborate’, was formally opened by Baroness Verma, Parliamentary Under-Secretary of State for the Department of Energy & Climate Change, who spoke about the importance of the supply chain and of the contribution made by such

events towards creating the right environment for business success.

The main hall featured 260 exhibition stands, staffed by a wide range of technical and service suppliers, alongside information stands representing the NDA, the SLCs, government bodies and regeneration organisations.

An Innovation Zone showcased leading-edge nuclear technologies and a number of demonstrations.

Also attending for the first time were representatives from the Ministry of Defence, Defence Equipment and Support and Submarines Operating Centre, with a presentation by Rear Admiral Mike Wareham.

Ron Gorham, the NDA's Head of Supply Chain Optimisation and SME Champion, said: "We are absolutely delighted by this year's success.

"The event is now in its fourth year, and is becoming an important fixture in the calendar for businesses in nuclear decommissioning.

"The success of our mission depends on vibrant, dynamic businesses that can provide solutions to the many challenges across the NDA Estate. We remain committed to working with our supply chain, from the largest to the smallest players, to improve opportunities for involvement."

The event is part of a series of initiatives developed over the past three years to encourage and support the supply chain.

*Photograph:*  
Above, Ron Gorham (left) and John Clarke (fourth left) with Baroness Verma (fifth left), Rear Admiral Mike Wareham and the MOD team

## Supply Chain Event - Awards



### Small businesses lead the way

A highlight of the event was the presentation of the annual awards, which recognise the vital contribution of suppliers to the UK clean-up mission.

An impressive level of technological innovation from smaller businesses left judges with a real selection challenge, according to Ron Gorham, Chair of the judging panel – hence three highly commended awards in the Small and Medium-sized Enterprise innovation category.

On a larger scale, meanwhile, James Fisher Nuclear Ltd scooped two awards and also featured in a third category.

Ron added: “The standard of entries was again extremely high, especially from SMEs who demonstrated a really inspiring

level of innovation in their approach to challenging situations.

“The winners have also excelled at adapting technologies from outside the nuclear industry, working together and showing an absolute determination to overcome problems and difficulties.

“These awards celebrate the commitment of our supply chain and the value they bring on a daily basis. It gives us great pleasure to acknowledge their critical role in delivering timely, cost-effective decommissioning across all of our sites.”

Ron paid a special tribute to the winner of the collaboration category: Give2Gain involved no fewer than 31 organisations.

“Despite being competitors on a daily basis, they have jointly brought enormous benefit to the skills agenda – well done,” he said.

*Photograph:  
Above, delegates listen to one of the presentations*

**Contractor:**  
Event management - Marick Communications

## 'Extra mile' category

Awarded to the supplier who has gone that 'extra mile' to deliver a contract, or something of value that made a difference within the NDA Estate or supply chain, whatever the size of company. This might be excellent customer service, sheer determination and commitment to succeed in the face of adversity - something unusual, exceptional or creative, that made a difference and delivered benefit.

### Winner

**James Fisher Nuclear:** Radiometric Instrumentation Metrology Contract Delivery.

### Highly Commended

**Aquila Nuclear Engineering:** Berkeley Chute Silo – Flask and Export Plant.

### Also shortlisted

**Thomas Graham & Sons**

## Best supply chain collaboration

This category is open to suppliers who have worked collaboratively within the supply chain. Examples could be suppliers who have brought together everyone involved in the delivery of a project or contract, working towards a common goal and finding collaborative solutions to problems, or those who have successfully integrated SMEs into the supply chain.

### Winner

**Give2Gain**, a skills programme pilot, backed by £1 million of funding provided by the Employer Ownership of Skills Programme.

Headed by NIS Ltd and co-ordinated through the National Skills Academy for Nuclear with: AMEC, Bendalls Engineering, Capula, Cavendish Nuclear, DRS, Energus, Esterline/Darchem, Fort Vale, Forth Engineering, Gleeds, Graham Engineering, Hare Structural Services, Helander, Horizon Nuclear Power, James Walker, JF Nuclear, Lab Impex Systems, NES Engineering Innovation, NIS Ltd, NSG, NDSL, Nuvia, SR3C Ltd, Rotork, Servelec Controls, Studsvik, Supacat, Tata Steel, TIS Cumbria Ltd, Wallace Sheet Metals.

### Highly Commended

**Hertel, Shepley Engineers and AMEC:** Collaboration on Sellafield Multi-Discipline Site Framework.

### Also shortlisted

**Sellafield Supply Chain Coalition:** Cavendish Nuclear, AMEC, Morson Projects, Cape Industrial Services, Jacobs Engineering UK, NIS Ltd, Shepley Engineers, Vinci Construction UK, Hargreaves, Balfour Beatty, Capula, Carillion, Doosan Babcock, Hertel, Nuvia, Redhall, Jacobs Stobbarts Ltd.

## Minister's award

Sponsored by the NDA's Minister who recognises the great value, flexibility and innovation SMEs bring to the decommissioning mission. Selected from all SME entries across the categories.

### Winner

**Thomas Graham & Sons:** Engineering supplies across the NDA estate.

### Shortlisted

**Steve Vick international**  
**NATAS Asbestos: Nuclear Ltd**  
**NSG Environmental Ltd**  
**Mechatech Systems**

## Best example of innovation – SME category

Whether a new product/process or adaptation of technology from other non-nuclear markets, innovations bring savings and are a key focus for the NDA Estate. This category is split into two awards, one for SMEs and one for larger suppliers.

### Winner

**Steve Vick International:** BEPO Storage Block decommissioning at Harwell.

### Highly Commended (1)

**Mechatech Systems:** Berkeley vacuum drying system.

### Highly Commended (2)

**NATAS Asbestos: Nuclear Ltd:** 360° site survey of SGHWR Primary Containment, Winfrith.

### Highly Commended (3)

**NSG Environmental Ltd:** Berkeley Caesium Removal Plant Waste Retrieval.

## Best example of innovation – large business category

### Winner

**James Fisher Nuclear:** Sellafield Remotely Operated Vehicles (ROVs).

### Shortlisted

**Cavendish Nuclear**  
**Jacobs**  
**NMMI Engineering Ltd**  
**PaR Systems Ltd**

# spotlight on R&D



## UK research company maps Fukushima radiation

A small UK research company is supporting the Fukushima clean-up with sophisticated, tailor-made technology that detects and maps radiation with pinpoint accuracy.

Createc's N-Visage™ system, developed and exhaustively tested over a number of years, has been specially adapted for use at the stricken Japanese plant, where it is hoped to become the primary technology for mapping contamination inside all the reactor buildings. The system is compact, lightweight and can be deployed through small openings, in tight spaces and in high-dose environments.

The £0.5 million contract with clean-up contractor Hitachi is the largest ever secured by the Cocker-mouth-based firm, which specialises in developing innovative applications of imaging technology.

Createc's unique system operates in stages, combining radiation measuring and the latest sensor technology with advanced 3-D computer modelling. The result is an accurate distribution map of contamination and radiation levels in different parts of a facility, and the capability to predict how the radiation environment will evolve as the facility is modified or taken apart. Such information is critical to drawing up decommissioning plans across the NDA estate, and will inevitably be vital as the decommissioning of Fukushima is taken forward.

Createc, which was spun out from REACT in 2010 as an independent R&D business, employs 12 staff and

specialises in developing innovative applications of imaging technology.

The Fukushima work arose following a 2012 Cumbrian trade mission to Japan backed by Britain's Energy Coast, which provided an opportunity for a number of businesses, including Createc, to demonstrate the technology before a reciprocal visit by Hitachi to west Cumbria. The mission was also supported by the NDA, NMP, INS, the Government body UK Trade and Investment and the British Embassy.

Createc Managing Director Matt Mellor said: "One of the Hitachi delegation compared finding the N-Visage technology in Cumbria to finding a rare Picasso in the attic, and we are thrilled



that our technology is able to support the Fukushima clean-up. The support from NDA and other funding organisations and the Japan mission have been incredibly important to us and other companies involved in decommissioning.”

He added that the Japanese enthusiasm for the technology had inspired Createc to renew its drive to make greater inroads into the UK market, which has so far proved difficult to access.

The technology is already being adapted for use in non-nuclear environments, such as airport security checks and other surveying applications.

“However, the next challenge for us is to see N-Visage™ deployed more widely at nuclear sites in this country, where we believe it will deliver significant benefits in terms of enabling greater understanding of radiation distribution and, therefore, optimum planning for taking facilities apart,” he added.

**Photographs:**

*Top, Createc’s technology accurately maps contamination, shown here in one of Fukushima’s reactors*

## New brochure outlines approach to investment

The NDA has published a new R&D brochure, which outlines its approach to one of the main routes for investing in the development of innovative technical solutions.



The 16-page brochure focuses on funds that are invested directly by the NDA in projects that can deliver innovation across the whole state, enhance technical skills and inform the UK-wide strategy.

Six case studies are included, demonstrating a range of funding mechanisms and different technologies at varying stages of development.

Approximately £85 million is spent annually to support site-level projects commissioned via the SLCs and a further £5 million on projects commissioned directly by the NDA.

Many of the directly funded projects are collaborations between different research organisations, including academic institutions, SLCs and the supply chain. Additional funds

are leveraged through joint initiatives with other public sector organisations.

Prof Melanie Brownridge, the NDA’s Head of Technology, said: “We are very proud of the progress that has been achieved from our R&D investments. Our aim is to leverage our funding where possible and encourage further collaboration to address the unique challenges on our sites.”

A further brochure is planned that will look at R&D carried out within the Site Licence Companies.

To request a hard copy, email: [research@nda.gov.uk](mailto:research@nda.gov.uk) and for a digital copy, see the NDA’s website: [www.nda.gov.uk](http://www.nda.gov.uk)

## NDA's R&D funding supports progress

For the NDA, which contributed towards development of the software in 2009 via £50,000 of funding support from the strategic R&D portfolio, Createc’s success demonstrates the huge importance of identifying and encouraging relevant research and development.

The initial NDA funding enabled Createc to extend the system’s capabilities to a wider range of situations, making dramatic progress in a short space of time.

The company secured £2 million of further investment through the 2012 joint awards by the Government’s Innovate UK (formerly

the Technology Strategy Board), NDA, the Department of Energy and Climate Change (DECC) and the Engineering and Physical Sciences Research Council, which contributed to additional progress.

Prof Melanie Brownridge, NDA Head of Technology, said: “We are delighted to see how Createc’s technology has developed and is now being fully deployed in a difficult nuclear environment. It has been trialled successfully at Sellafield and has great potential for use at other NDA sites.

“It is critically important to support promising concepts at the early stage and encourage progress and maturity of the technology right through to market deployment. The joint approach with other organisations is also important in securing sustained funding.”

# £13 million for safe, smart technologies

Decommissioning technologies are among the projects set to receive a financial boost following a £13 million joint initiative to stimulate the UK’s nuclear sector.

Innovate UK (formerly the Technology Strategy Board), the NDA and the Department of Energy and Climate Change (DECC) have collaborated to help encourage a strong, sustainable supply chain serving both national and global markets.

The projects to benefit include novel techniques for analysing contaminated concrete, thermal treatment of irradiated graphite and cheaper, more effective vitrification of Intermediate Level Waste. Some of the investment will enable the continuation of previously funded projects.

Following a competitive assessment process, varying levels of funding were awarded to 15 collaborative R&D projects, and a further 26 smaller-scale feasibility studies.

NDA Head of Technology, Prof Melanie Brownridge, said: “Our R&D strategy is very focused on developing innovative technologies that support our clean-up mission.

“Joint funding initiatives such as this greatly increase the investment potential across the whole nuclear sector and also,

importantly, bring research partners together collaboratively in the drive for progress and creative scientific thinking. I was very pleased with the level and quality of responses.”

The decommissioning market is set to expand over the coming decades, with up to 145 reactors, mostly European, expected to reach the end of their lives in the next 15 years and an estimated international market worth £50 billion annually.

The growth comes as the nuclear industry begins a major global expansion, with around £930 billion investment planned in new reactors, including the first UK nuclear power station to be built since 1995, at Hinkley Point C.

Innovate UK Chief Executive Iain Gray added: “These proposals, and the consortia behind them, will help our civil nuclear industry set new standards in safe and smart operation. All the innovations you see here will either help the UK consolidate areas where we are world-leaders or help us move towards that position in others.

“It marks a significant step forward for

civil nuclear operations which are smarter and safer than ever before, and it’s a great commercial opportunity for UK plc and its businesses.”

The 2014 awards followed an earlier collaborative initiative two years ago, funding more than 30 projects, and build on the recommendations of recent reports on the UK’s civil nuclear sector, including the Government’s Nuclear Industrial Strategy published in March this year. They also demonstrate sustained innovation funding.

[www.innovateuk.org](http://www.innovateuk.org)

A number of collaborative decommissioning projects received support, ranging from around £300,000 to £1 million each, including:

Project	Lead Partner	Summary
Thermal Treatment of Irradiated Graphite	Costain, Manchester	A combination of new techniques to thermally treat irradiated graphite, enabling a dramatic reduction in volumes to be stored.
ViridiScan: a novel mobile NDT decommissioning sensor	Viridian Partnership, Dorking, Surrey	On-site laser analysis of contaminated surfaces in both open and confined spaces: quicker, safer for personnel and removing the need to transport radioactive material hundreds of miles.
The first Detectable Permeation Grouting System	BAM Ritchies, Kilsyth, Scotland	Difficulties arise in measuring the reach of grouting cement injected into the ground to form barriers against water and contamination movement. This project will develop the world’s first reliably detectable grouting system – improving barrier safety and construction efficiency.
SmartScan	Symetrica Security Ltd, Southampton	A nuclear ‘toolbox’ of thermal neutron and enhanced gamma detectors for non-destructive characterisation of nuclear materials and waste.
D:EEP: Estimating Entrained Products	Create Technologies Ltd, Cockermouth, Cumbria	A non-destructive technique measuring extent and depth of radioactive contamination in concrete, removing the considerable risks involved when assessing facilities due for demolition.
Post Operational Clean Out (POCO) residues	Sellafield Ltd, Cumbria	New glass formulations to immobilise solids from historic storage tanks, enabling the overall volume reduction of the UK’s high level waste and helping to accelerate the nuclear waste clean-up programme at Sellafield.
Hazmelt	Glass Technology Service, Sheffield	A novel electrode design to allow cheaper and more effective vitrifying – turning into glass – of Intermediate Level Waste types.
Flexible Charged Particle Detector for Nuclear Decommissioning	Kromek Ltd, Sedgefield, County Durham	A ‘thin film’ alpha radiation sensor to provide the first cost-effective solution for detection and measurement of alpha particle contamination in pipework in a nuclear power plant.



# New faces join the challenge

A record number of apprentices have been taken on at Sellafield to help drive forward the NDA's most complex decommissioning programme.



One hundred and seventy youngsters have begun apprenticeships with Sellafield Ltd, as the site ensures it has the skills it needs to complete its mission.

A quarter of this year's intake is female, which is seven times the national average rate in the nuclear industry.

The new recruits, mostly aged between 16 and 18, will join local training provider Gen2 for the first year of their programmes before moving on to roles with Sellafield Ltd.

They can look forward to a world-class three-and-a-half year training scheme with a job in the nuclear industry guaranteed for those who successfully complete the course.

Jamie Reed, the MP for Copeland, whose constituency includes the Sellafield site, said: "It's vitally important that we grow the skills base in the UK so that we can respond to the challenges posed by industry.

"Investment in the education and training of young people is an important route to

helping build a more sustainable industrial future.

"I am pleased to see the taxpayer receive a return on the Government's significant investment of taxpayers' money at Sellafield.

"The chance to complete an apprenticeship offers a route to raise the aspirations of young people, and it is very encouraging to hear that those who successfully complete the course will have a secure, well paid job at the end of it where they'll be performing the important duty of contributing to the decommissioning of Sellafield.

"And if they choose to go down a different career path they'll do so with a fantastic qualification and bags of experience in nuclear and energy, which is a growth industry."

NDA chief executive John Clarke said: "The scale of the challenge at Sellafield is immense but with that challenge comes huge opportunity both for individuals and for the UK as a whole.

"A diverse range of skills will be required over many decades to complete the mission and it's important that local young people are given the chance to grasp those opportunities.

"The skills they acquire will last a lifetime and benefit the UK economy for their entire working lives.

"I'm particularly pleased to see such a large intake of female apprentices. Engineering in general, and nuclear in particular, do not have a diverse enough workforce – it's essential that we use the talents of everyone in order to make our industry more effective and more reflective of society."

*Photograph:*

*A record 170 young people have been recruited to apprenticeships at Sellafield*

# A final farewell to the Folly

Christopher Cockcroft was just eight years old when his physicist father insisted that expensive filters were fitted on top of the two Windscale Pile chimneys that helped to produce plutonium for the UK's Cold War weapons programme.

Nobel prize winner Sir John Cockcroft's belated safety requirement came after construction had already started and was criticised in the nuclear industry as 'over the top'. The chimneys were dubbed Cockcroft's Follies.

But the pioneering scientist's foresight helped to prevent the 1957 Windscale fire from escalating into a full-blown nuclear catastrophe that could have spewed contamination across much of northern England.

Christopher, now 72, paid tribute to his pioneering father when he attended a commemorative ceremony to mark removal of the final section of the filter gallery from the remaining chimney.

"It's a huge honour to be here to see this work being carried out. We should remember the exemplary courage and devotion of the Windscale men who fought to control the fire back in 1957. My father would be extremely proud to know that his legacy of safety in the nuclear industry lives on at Sellafield today," said Christopher, one of the guests who climbed the chimney to witness the 530-tonne structure being taken down. He was accompanied at the ceremony by Sir John's grandson.

One of the chimneys was reduced in height 12 years ago and Sellafield Ltd is now tackling the crucial task of bringing the more heavily contaminated second chimney to the ground.

At 110 metres, the chimney is taller than the Statue of Liberty. Some 5,000 tonnes of concrete, steel and brick will be carefully dismantled and safely disposed of, after being monitored for any remaining contamination.

Although Sellafield was at the forefront of pioneering nuclear technology, the old plants had few of the safety features which would now be deemed essential. In October 1957, a fire took hold in Pile 1 reactor, reaching 1,300 degrees C.

Thankfully, Sir John had insisted on the high-performance filters. However, the



decision was made after the chimney barrels had been designed and partially built, so the iconic bulges were fitted at the top of the structures and successfully captured most of the radioactive contamination.

Tony Price, Managing Director of Sellafield Ltd said: "Dismantling this chimney is one of the most visual demonstrations of the progress we're making to clean up Sellafield. Cockcroft's Follies prevented a catastrophe, but the 1957 fire was nevertheless a dark hour for nuclear in the UK and one from which much was learned. It is testament to Sir John that the UK nuclear industry is today one of the safest in the world."

Sellafield's Chris Wilson, leading the chimney demolition, said: "The team has worked towards the safe delivery of this project for many years, so to be able to share this success with the family of John Cockcroft has been a great privilege.

"The decommissioning challenges posed by the Windscale Pile reactors and chimneys are unique. It's a complex job in terms of both radiological and conventional safety, with no instruction manual."

#### Photographs:

*Opposite page, from the left, grandson John Cockcroft, son Christopher and Project Manager Chris Wilson view Sellafield from the Folly, above, before it is dismantled*

# “My father would be extremely proud to know that his legacy lives on”

Christopher Cockcroft



## FACT FILE

- The original pile chimneys were built between 1947 and 1950. Identical in structure, with a 14-metre diameter reinforced concrete structure, they consisted of seven major sections: foundations, main shaft, diffuser, filter gallery with plant rooms, concentrator section, upper section and access shaft.
- Following the fire, the chimneys were sealed at the top, the contaminated filters removed and air inlet ducts isolated. Radiation levels had to reduce significantly before decommissioning work could start. The first chimney was reduced to the level of the adjacent reactor building in 2001, however the second chimney posed more of a challenge due to radioactive contamination from the fire.
- Decommissioning progress on the remaining chimney involved: stripping out the thermal insulation lining, taking down the concentrator, dismantling the filter in-fills, removing the four 10-tonne winches that moved the head gear platform inside the chimney and on which a remotely operated demolition vehicle was used to remove the chimney lining and steel work.
- A combination of manual and semi-remote techniques are being used to provide the safest approach. These include concrete and steel cutting techniques, lifting capability through cranes and standard lifting apparatus, climbing platforms commonly used to access chimney stacks.

# Wylfa can keep the lights on until 2015

The world's last operating Magnox plant, Wylfa on Anglesey, has secured an extra lease of life and is now scheduled to generate electricity for five years longer than originally anticipated.

## Double awards for Magnox

Wylfa's work on the extended generation has been recognised as a Programme of the Year at this year's Association of Project Management (APM) awards.

The award was one of two prestigious honours for Magnox Ltd at the annual ceremony in London.

Issues associated with the end of fuel production were overcome through the transfer of partially used fuel between the shut-down reactor and its one remaining operational reactor. The project was the first of its kind in the UK, requiring the team to deal with a range of challenges in reactor operation, fuel management and plant safety as well as meeting practical, physical and regulatory constraints.

Magnox also won the Project Professional of the Year category for the work on decommissioning the former spent fuel cooling ponds across the 10 UK sites.

The APM Project Management Awards has been awarding project management excellence for over 20 years. Recognising the very best in the profession, winners of the sought-after trophies demonstrate the invaluable contribution project management and project professionals make in all sectors.



An estimated £785 million of additional income will have been secured from the additional lifespan, helping to offset the costs of the NDA's decommissioning mission.

Originally scheduled to close in 2010, the Anglesey plant has been granted a number of lifetime extensions after demonstrating to the regulators that it can continue to meet the stringent safety requirements. It can now operate until December 2015.

The largest and last of its type to be built in the UK, Wylfa's twin reactors date from 1971 and once supplied enough electricity for almost half of Wales. Reactor 2 stopped generating in 2012 while Reactor 1 has continued to operate, using partially used fuel that was transferred from the shut-down reactor – manufacture of the fuel ceased in 2008 and the stocks have gradually been used up.

Magnox submitted a Periodic Safety Review (PSR) to the Office for Nuclear Regulation (ONR) in September 2013. The PSR, required every 10 years, includes a review of the safe operation of the site for the subsequent 10 years and encompasses periods of power

generation, defueling and initial decommissioning.

Stuart Law, Wylfa Site Director, said: "We are pleased that Wylfa's extended generation will allow us to maximise income from generation for the site's owner, the NDA and the UK taxpayer, and also provide another 15 months of opportunities and continued development for staff. A lot of people contributed and worked hard on the PSR and this result is a real credit to them.

"This will be Wylfa's final period of generation. After December 2015, we will follow in the footsteps of other Magnox sites and begin to defuel the reactor which will take up to three years."

Dr Brian Burnett, NDA Head of Programmes, added: "I welcome the ONR's decision. Wylfa is an important asset and this announcement is good news for the UK's energy supply, for the NDA and for the people of Anglesey. I thank everyone whose efforts have contributed to this successful outcome."

*Photograph:*

*Top, staff at work on the reactor pile cap*



## Success is what it all boils down to

Almost 18 months ago, the town of Berkeley came to a standstill as the last of 15 huge redundant boilers trundled away from the nearby nuclear site, loaded on massive transporters.

Now, the remaining pieces of the metal giants, each weighing 310 tonnes, have been smelted down at a specialist plant in Sweden – with a small quantity turned into commemorative plaques to mark completion of a project that has seen more than 4,000 tonnes of metal recycled and returned to the open market.

The project has also saved more than 5,500 cubic metres of space at the UK’s Low Level Waste Repository, where the boilers, classified as Low Level Waste (LLW), were originally scheduled for disposal.

Only 3% of secondary residues will be returned next year for final disposal at LLWR, near Drigg in Cumbria.

Simon Bedford, Magnox Project Manager, said: “This marks the end of a huge project for Berkeley. Our aim is to reduce risk and cost associated with the Magnox decommissioning programme through innovative approaches and this was no exception. By working collaboratively with LLWR, ALE Transport and Studsvik, we were able to achieve a very positive outcome, recycling around 95% of the boilers.”

To mark the project’s success, key individuals and stakeholders were invited to Studsvik’s nuclear licensed site in Sweden. Magnox and LLWR representatives were presented with engraved plaques made from the recycled boiler steel.

The group retraced the boilers’ Swedish journey from the harbour to the specialist large components storage hall, the cutting booth and finally the melting facility. Guests witnessed the last remaining piece of boiler being size-reduced and sectioned, then shot-blasted to remove any contamination and eventually being sent to the furnace for the final melt.

The original plan for the boilers, which dominated views around the site for many years, was to leave them outside the reactor buildings until final clearance of the site in 2074, when they would have been consigned to the LLWR. Additional NDA funding allowed early removal, and the project required extensive collaborative working.



The project won the NDA’s Collaboration Award in 2012, when it was described by the judging panel as the “largest-ever shipment of decommissioned components from a UK nuclear site”. The joint winners were: Studsvik UK Ltd, ALE Transport, LLWR with Costain, Assystem, Doosan Power Systems, Wynn & Sons, Meriaura and Oceanearing.

*Photographs: Above, the boilers were cut up and smelted before some of the remaining pieces were made into plaques with one presented to Berkeley Site Director Alan Neal (centre right) by Nigel Kitt of Studsvik*

# Dressmaker Gail finds perfect material for radiation camera

When Dounreay decommissioning specialists began wondering about procuring a bespoke cover for their radiation-detecting robotic camera, they found the perfect material ..... at a local dressmaker's.

Ironing-board fabric and a 7.0 tog duvet were used for the tailor-made insulated hood that will help to combat heat inside the high-hazard Dounreay Fast Reactor vault.

Ultimately, it will contribute towards removing residual amounts of the highly dangerous liquid-metal coolant sodium-potassium, known as NaK.

"The robot was actually easier to work with and less stressful than some humans. It was a challenge, but as a dressmaker nothing is too challenging and no request is impossible," said seamstress Gail Russell, who works for Elizabeth's Fabrics in Thurso.

"I needed to cut in darts like the bust of a dress and allow for movement of the camera head," she added.

Dressmaker Gail accompanied shop owner Elizabeth Macdonald on a site visit to hand over the cover for the last of several test fittings.

The camera, designed to take pictures of radiation sources, is normally used with a tripod but will be trialled with a new deployment method and lowered upside down through the roof into the reactor vault.

During scans lasting many hours, the camera will look through the steel pipework and vessels to see the radioactive coolant inside, gathering critical information for the clean-up.

The deployment kit was designed and manufactured by DSRL's in-house design and workshop teams, while the hood was designed and manufactured in collaboration with Elizabeth's Fabrics.

The vault contains the reactor vessel within a graphite shield. The space contains numerous vessels and kilometres of pipework which, during operations, carried the primary liquid metal coolant (NaK) from the reactor core to the heat exchangers.



The team face unique challenges with the facility, which is more than 50 years old. Parts of it have been unseen for decades and creativity was required to design equipment capable of looking inside.

"This shows how some lateral thinking 'outside the box' and solid team work can solve technical problems. The camera should allow the team to see any radioactive coolant blockages inside pipework - it's a bit like having X-ray vision," said Aly Mackay, DFR characterisation and dismantling project manager.

"A lot of innovation was required to put this inspection together and it could be a real game-changer for the removal of residual NaK and for us to understand what radiation will still be there when we come to dismantle this

complex structure."

Ken Heider, project director for reactors, added: "The DFR NaK is one of the highest hazards for the NDA estate and the safe removal of this highly dangerous material and dismantling of associated facilities is crucial to the site's decommissioning programme."

*Photograph:*

*Elizabeth Macdonald, Robin Herrick, Sanders Macdonald, Gail Russell, Steven Craigie*



## Views shared on new organisation

More than 70 stakeholders attended Radioactive Waste Management's (RWM) first stakeholder event in Birmingham in September to hear about the new organisation, its mission and how it plans to go about its business.

Stakeholders were also engaged in sessions to feed back thoughts on how RWM should progress.

Bruce McKirdy, RWM's Managing Director, welcomed the attendees and introduced the new company, its new role and new identity. He emphasised the need for RWM to listen to public concerns and to answer questions in ways the public understand.

In a video message, Baroness Verma, Parliamentary Under Secretary of State for Energy and Climate Change, said: "RWM was set up to give greater focus and accountability to the implementation of the Government's geological disposal policy for higher activity radioactive wastes. But their work is not just about developing a geological disposal facility – it is also about working with industry to find innovative and effective solutions to preparing and packaging waste for safe long-term storage and disposal."

The event included presentations and Question and Answer sessions with the RWM Executive team. Peter McDonald, Acting Siting Director for

RWM, outlined the Implementing Geological Disposal White Paper which sets out actions for the next 24 months, including:

- Land-use planning (DECC led).
- Working with communities (DECC led).
- National geological screening (RWM led).
- Preparing for community engagement (RWM led).

His presentation was followed by Ann McCall, Director of Waste Management, who spoke about her team's work to develop new ways of working with waste packagers, support to NDA Strategy and assessments of waste packages so they are suitable for a geological disposal facility.

Alastair Burns, Managing Director of Burns & Co, gave a presentation on consumer research preceded by a selection of video clips in which members of the public expressed views about radioactive waste.

Alun Ellis, Science and Technology Director, focused on:

- The continuing need to undertake research and keep abreast of international developments so designs and safety case are based on latest knowledge.
- RWM plans for peer review and external scrutiny.
- Engagement with the regulators, to underpin RWM's safety culture and competence.
- The recently published Science and Technology Plan.

Finally, Professor Neil Chapman, Chair of RWM's Technical Advisory Panel, described the panel's role in helping RWM deliver its programme.

There was also a session in which stakeholders broke into groups to discuss expectations on the siting process and radioactive waste management.

*Photographs: Top, RWM Managing Director Bruce McKirdy (right) in action as (left) stakeholders feed back their views*



## Archive plans move forward

Public consultation continues on the NDA's plan for a nuclear archive at Wick in Scotland that will house more than 70 years' worth of historic and current information from across the UK's civil nuclear industry.

The start of the 12-week planning consultation process was marked by an exhibition of architects' plans and mock-ups and opportunities for face-to-face dialogue with the project team. Scores of visitors called in during the event, held in Wick, including residents, businesses, council representatives and other organisations.

The consultation will be followed by submission of an application for planning permission to Highland Council in January 2015.

The NDA archive is being developed in partnership with Highland Council, whose own North Highland Archive records will also be housed in the facility.

Separately, the procurement exercises are also under way to appoint a commercial partner who will operate the archive, as well as a design and build contractor.

Potentially employing around 20 full-time staff, the archive will bring together vast numbers of records, plans, photographs, drawings and other important information

dating as far back as Second World War, that are currently stored in various locations around the country.

Much of the information will eventually be digitised and made available for electronic research, and to support the ongoing decommissioning mission.

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

The Wick facility will also be developed as a base for training archivists, potentially offering apprenticeships, linking up with the University of the Highlands and Islands and the local community.

NDA is also committed to working with other regional heritage centres around the country.

## Information Governance Programme

The archive project is part of a much larger NDA workstream, The Information Governance Programme (IGP).

The IGP's objective is: To maximise business value from the NDA knowledge and information assets in a compliant and secure manner. All NDA Site Licence Companies and subsidiaries are involved.

When the NDA was established in 2005, it acquired responsibility for the huge volumes of information accrued at its sites over decades and held in a multitude of formats, as well as information yet to be produced.

As a Government body, the NDA is required to ensure this material is preserved in line with legislation on public information and that it meets the needs of the NDA estate.

The level of 'information' covered is extremely wide and includes: archived operational records, plant designs, graphics, photographs, publications, digital records, intellectual property, research documents, waste records - and even the intangible professional expertise acquired by staff during their careers.

The IGP will also require the safeguarding of sensitive material, the duplication and/or destruction of records where appropriate, the sharing of knowledge to support decommissioning activities, ensuring access and agreeing systems for managing the information in both digital and hard-copy formats into the future.

The NDA's Head of Information Governance Simon Tucker is leading the IGP, which has been in the planning phase for nine years and will continue for many years to come.

Watch out for further announcements in the near future!