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INSIGHT

into nuclear decommissioning

NDA

Nuclear
Decommissioning
Authority



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Dealing with the past. Protecting the future.

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Welcome to the summer edition of Insight magazine, which aims to provide an overview of our decommissioning activities around the UK. We hope you find it interesting and informative.

If you would like to receive copies on a regular basis, do send in a request. In the meantime, we would be interested in your views.

Comments to the editor Deborah Ward on 01925 802343 or deborah.ward@nda.gov.uk

Front cover: The remotely operated minidigger is lowered into the Bradwell ponds

Chief Executive Tony Fountain: We face a future of change

Change has been a feature of the nuclear industry since the NDA was established five years ago, and this looks set to continue for some time to come.

One very significant change has come with the arrival of the Coalition Government and I was delighted to have had the opportunity to host a visit from the Secretary of State for Energy and Climate Change Chris Huhne and Energy Minister Charles Hendry, who, within a fortnight of taking office, sought to see at first-hand the issues associated with nuclear decommissioning.

The tour of Sellafield provided the opportunity to demonstrate the progress being made, as well as outlining the challenges that lie ahead in taking forward the unique programmes of work designed to tackle the hazards left behind by the early nuclear research and power generation programme.

The timing of the visit was of particular importance because of the Government's impending review of all public spending.

We have been working hard with DECC and Treasury to explore a range of options in order to find the right balance between making progress on our mission and providing value for money within the affordability constraints. We have a clear, full picture of the challenges, and are confident that the private-sector expertise introduced to our sites through competitively tendered contracts leaves us well-placed to address the issues through strong performance, efficiency and innovation.

Our focus across all sites has been on preserving essential work to reduce the highest hazards, while deferring less critical programmes. We also believe it is vital to protect the skills base for future work that will still need to be carried out.

As we move forward, the NDA's own role must also evolve. The industry has been restructured and the resources



Tony Fountain: Focus on delivery and value for money

and expertise are in place across our estate, and so the time is right for us to pull back and allow our partners to take responsibility for delivery, whilst we focus on specifying our requirements and holding them to account for their performance.

We are becoming an ever more demanding customer on behalf of the taxpayer, but we must also demand the same of ourselves and in June we launched a consultation with our own staff that will result in the NDA being a more streamlined and effective organisation.

One further piece of change is that we will be losing Richard Waite who has been offered an exciting opportunity to work in the private sector part of the nuclear industry with CH2M HILL. Richard has made a fantastic contribution to the NDA from its beginning and we are sorry to see him go. His departure brings in to focus the challenges for the public sector of competing for the best available talent.

Clare Spottiswoode is the Chairman of EnergySolutions EU Ltd, operator of the NDA's Magnox sites. She is, however, perhaps best known for her role as Director General of Ofgas, in the UK, from 1993-1998 where she oversaw the transformation of the gas industry following privatisation. A main board member of EnergySolutions Inc and former Deputy Chairman of British Energy, Clare also chairs Gas Strategies Ltd, is a non-executive director of Tullow Oil and security group G4S and a member of the Which? Banking Commission which aims to put consumers at the heart of a reformed banking system.



Clare Spottiswoode: Efficiency savings can only take us so far

Obligation to clean up safely

by Clare Spottiswoode

In my new position, I am frequently asked two questions: what is it that brought me back to the nuclear industry; and why specifically with EnergySolutions? The answer is that I am passionate about the need for new nuclear as there is no other way to deal with climate change on the scale we

need at a reasonably affordable price. However, there can be no legitimacy in building new nuclear without proving that we can clean up the legacy waste. My role with EnergySolutions allows me to play my part in ensuring that this happens.

The waste would need to be dealt with whether or not the UK embarks on a programme of new build; we have an obligation to present and future generations to clean up in a safe, sustainable, and long-term manner. To maintain support for new reactors though, we must first show that we can deal with the consequences of the old. The NDA has brought admirable focus

and drive to this task but the challenge for us all is to continue to ensure that tangible, demonstrable progress is made. In this job, efficiency savings can take us only so far. What will really be needed is both proper ongoing funding of the decommissioning programme and fresh thinking on technologies and techniques for tackling the waste.

Exploring the links between the waste and new build will also bring real benefits in terms of plugging the skills gap. As I visit nuclear sites, I am constantly impressed by the dedication, enthusiasm and talent of the workforce. How we can transition these skilled and knowledgeable individuals into the new build programme, retaining them within the industry whilst also supporting the local communities and the supply chain, is something that all of us in leadership positions should be actively turning our minds to. In this, I am greatly encouraged by the work of Jean Llewellyn and her team at the National Skills Academy for Nuclear and the skills initiatives that the NDA are leading, but let's really get joined up across the sector. A decline in our skills today is a shortage for tomorrow which would take years to rebuild.

Of course, to move our workforce from decommissioning to new build requires the clean-up work to be carried out on a timescale that dovetails with the needs of the new reactor programme. I believe this is readily achievable. By building on both our UK and international knowledge and experience, we are rolling out innovative, game-changing technologies and solutions which mean that safe acceleration of the work programme is within our grasp.

All of which means we can look forward with optimism but only if we address the legacy challenge and protect our precious skills. In this regard the NDA deserves our full support.

Tackling the ponds clean-up

Innovation has transformed a clean-up challenge at the Bradwell ponds complex into a trailblazing approach that is now being adopted across the Magnox estate.

Having secured this approach as a foundation for all future ponds decommissioning, a potential £15 million saving is set to be delivered across all sites over the next seven years, together with the more intangible but equally valuable benefit of building an unsurpassed level of expertise in the difficult area of ponds clean-up.

Further significant savings are likely to result as work begins on the next ponds decommissioning phase which follows the clean-up.

The initiative began as a drive to use existing expertise more effectively rather than relying on the conventional site-by-site approach. This evolved into the creation of a uniquely specialised team from different disciplines, which was then integrated into the existing project team, who worked to inspire each other, sharing learning and finding the best way forward. Now called "programmisation", other decommissioning challenges are being tackled in the same way following assessment and approval by the NDA.

In this case, a combination of expertise from Bradwell and Hinkley Point A, led by the former Hinkley Point A Site Director Bob Kury, who had a wealth of radiological decommissioning experience, were the key components that delivered success for the project.

A 12-strong team joined Bradwell and integrated into its newly created team which was setting out to address the hazards associated with clearing and draining the ponds, empty of spent fuel since 2005.

The pooling of knowledge, skills and experience generated an energy and enthusiasm that led to rapid progress, with a focus on finding in-house solutions to engineering conundrums that might otherwise – following standard practice - have been outsourced at great expense. Control and supervision were



Ultra high-pressure washing of the walls from a floating pontoon

also enhanced, along with contingency planning.

Justin Barnes, Bradwell's Field Delivery Manager, said: "The site team members have strong engineering backgrounds and this approach, where we learned much from the Hinkley experience, built on that knowledge, allowing people's talents to be used in designing our own solutions and thinking more creatively. This in itself develops new skills and a better equipped, more motivated workforce."

Among the pioneering techniques, all of which must comply with nuclear safety regulations, were the development of an ultra high-pressure water jet cleaning system for use below the pond surface, use of floating pontoons instead of scaffolding and the deployment of a remotely operated vehicle (ROV) that had been specially adapted for underwater use at Hinkley after being bought, at minimal cost, via an Ebay site. Re-adapted for Bradwell, the ROV now looks set to be an integral piece of Magnox pond cleaning kit.

Deputy Site Director John Grierson added: "Often we do not need complex engineering solutions, just robust simple engineering equipment that can do the job. The programmisation approach represents a cultural change, it develops real expertise that can benefit all the sites."

Programmisation leads to a continuing accumulation of knowledge and skills that will keep producing benefits across the entire NDA estate. The team that galvanised the Bradwell project has now moved on to Chapelcross, where the ponds are no longer utilised. Options are being evaluated to support other sites, including Sellafield and Hunterston A.

Meanwhile, after two years work, one of the Bradwell ponds is completely drained down, with the innovations, processes and working practices serving as a benchmark for the next site. In the next four years further activities will see the ponds project complete to enter safely into care and maintenance.

Clean-up challenge

Removing spent fuel from a nuclear site takes away 99% of the radioactive hazard, but one of the major challenges remaining behind is the highly contaminated ponds.

Constructed above or below ground and lined with concrete, ponds are used to cool highly radioactive spent fuel, which is kept in skips, before being sent to Sellafield for reprocessing.

The water in the ponds serves the dual purpose of acting as a barrier against radiation and dispersing heat from the spent fuel.

Spent fuel can be stored safely in ponds, in skips, for long periods, sometimes for years.

Over time, however, the ponds have accumulated debris from the fuel elements and other items of 'furniture'. In some cases, sludge also accumulates from, for example, corroded fuel, making retrieval even more difficult. The skips and all pond contents require expert safe removal and disposal, while the ponds must be cleaned, drained and sealed before eventual demolition.

The clean-up process takes years and is extremely challenging, with high levels of protection needed for the workforce aided by regular use of remotely operated equipment.



Waste management

Landmark contract for MiniStores

The Magnox sites have joined forces to sign a landmark contract with German firm GNS Gesellschaft für Nuklear-Service mBH, worth up to £106 million, for the supply of Intermediate Level Waste (ILW) storage containers, otherwise known as 'GNS Yellow Boxes' or MiniStores.



Desiccant, successfully transferred to GNS Yellow Boxes at Bradwell and Wyffa



A MiniStore is manoeuvred into place

An initial order of 69 boxes will be delivered later this year – largely to support critical projects at Berkeley and Bradwell. Teams have been established at both sites to prepare for box filling, which is expected to get under way next year, subject to final regulatory and stakeholder endorsement.

It follows a mandate from the NDA to implement an ILW management programme based on the use of the

individually shielded storage containers, replacing the previous concrete waste store approach. Magnox Programme Director Mike Gull said: "This shows our clear commitment, not only to deal with waste issues at the Magnox sites, but also to introduce innovation and challenge existing plans to ensure safe, flexible and cost-effective clean-up for the taxpayer."

Meanwhile, Bradwell and Wyffa have joined Dungeness as the first sites to successfully fill MiniStores. The two sites have taken advantage of an opportunity to accelerate hazard reduction, by filling one box each with desiccant – a drying agent previously used in the reactor circuits.

The desiccant will be stored in the box for the period of care and maintenance. During this time it will decay, enabling it to be disposed of as Low Level Waste – saving space in the Geological Disposal Facility (GDF) and enabling the container to be potentially reused for other ILW.

Dissolving waste could save £35 million



Dissolution can reduce the volumes of FED currently stored in Bradwell's vaults by up to 97%

The amount of Fuel Element Debris (FED) requiring interim storage and final disposal is being drastically reduced, due to the success of an innovative technique spearheaded by the Magnox sites.

Dungeness A in Kent was the first site to introduce dissolution more than 10 years ago. FED, made up of metal components removed from the casing of fuel elements after use, is the largest radioactive waste-stream in terms of volume after the fuel itself.

The waste is dissolved in an acid solvent and then treated to capture the majority of radioactivity. The effluent is then

discharged within the site's authorised discharge limits. Assessments by the Nuclear Installations Inspectorate and Environment Agency have demonstrated the process has negligible environmental impact.

Following the success of the Dungeness programme – which has so far dissolved more than 80 tonnes of waste and is predicted to save the taxpayer more than £35 million during its life - other sites are beginning to adopt this approach.

Bradwell has led the development of an updated dissolution programme, taking account of the latest technology and the learning from Dungeness, which has resulted in dissolution replacing encapsulation of FED in the site's Lifetime Plan.

Programme director Steve Walters said: "A thorough review has demonstrated that dissolution is the best practicable

environmental option for Bradwell. Not only does it save money, but Bradwell alone can save 269m³ of packaged container space within the national Geological Disposal Facility (GDF) using this approach."

Lessons learned from the Bradwell development are now helping Sizewell A, Hinkley Point A and Oldbury undertake similar changes to their plans. Steve added: "The four sites combined have more than 2,000m³ of raw FED on site that needs to be managed – meaning there is plenty to gain from the safe and efficient use of dissolution to reduce waste volumes by 97%."

A contract will be awarded later this year to build a dissolution facility at Bradwell, with the three remaining sites expected to update their plans over the coming months.

Dedicated teams keep the lights on

The world's two oldest operating Magnox power stations are continuing to safely generate electricity beyond their scheduled closure dates after a huge amount of innovative work and a dedicated team effort.

The revenue from Oldbury, in Gloucestershire, and Wylfa, on Anglesey, contributes a significant level of funding to assist with decommissioning. In the past financial year, 2009-2010, the plants provided enough energy for more than 1.5 million homes and earned well over £300 million in revenue.

The UK's 11 Magnox plants represent the first generation of nuclear power stations, with all but two now closed and at various stages along the road to decommissioning.

Oldbury was planned to close in December 2008 and Wylfa in March 2010, dates that were originally set to meet reprocessing milestones at Sellafield. Subsequent adjustments to the programme, which postponed the scheduled start of de-fuelling, brought an opportunity to revisit these dates and consider extending the life of the plants

– providing it could be achieved safely and with the consent of the nuclear regulators and the Government.

Both have already been granted initial extensions, Oldbury to mid-2011 and an additional nine months for Wylfa to December 2010.

As both plants have already operated for around 40 years, extending generation further has necessitated demonstrating that issues relating to ageing equipment, limited fuel stocks – manufacture of Magnox fuel has ceased - and safety have been comprehensively addressed.

At Oldbury, one of the main aspects was the condition of the graphite bricks that house the fuel elements and moderate the nuclear reaction. Over time, the graphite's density changes and has the potential to affect operations. An extensive programme of physics research, sampling, inspection and

assessment of the graphite core has enabled the development of a strong safety case.

Meanwhile, the team has also demonstrated that standard refuelling practices can be modified to improve generating efficiency, by shuffling fuel within the reactor to use remaining fuel most efficiently, while partially irradiated elements can be retained to avoid the need for fresh fuel.

At Wylfa, extensive programmes of internal reactor inspections and repair work have been essential, along with detailed reactor physics studies to ensure the optimum use of remaining fuel.

The NDA has asked Magnox North to prepare a safety case for extended generation at Wylfa until 2012. A decision is expected from the nuclear regulators by the end of the year.



Potential new use for land

Two parcels of land at the Capenhurst site in Cheshire have been removed from the legal restrictions that cover the NDA's nuclear sites.

The move, known as 'de-designation', was ratified by Parliament at the end of May releasing the two areas for re-use in the future.

This is the first full de-designation since the NDA was established.

The land may be re-used in the future by fuel enrichment company URENCO, whose operations are adjacent to Capenhurst, and potentially enables future investment.

Capenhurst was built in the 1940s-50s to produce enriched uranium for defence purposes and subsequently converted to use for civil programmes. The site now stores uranic materials while areas not required for storage are being decommissioned.

The two plots of land, at opposite ends of the site, once housed part of the gaseous diffusion plant used for enriching uranium, which was demolished as newer technology became available.

Any new developments will be subject to regulatory and other consenting processes.



Private-sector transfer brings reduced liabilities



Neil Longfellow, Managing Director of Springfields Fuels Limited, Joe Belechak Vice-President Nuclear Fuel, Westinghouse Electric Company, Mr Yasuharu Igarashi, Corporate Senior Vice-President and President and CEO of Toshiba's Power Systems Company, Aris Candris, President and CEO, Westinghouse Electric Company, Tony Fountain and John Clarke.

The permanent transfer of Springfields fuel manufacturing plant into the private sector marks another milestone in reducing the NDA's nuclear liabilities, while at the same time bringing the prospect of additional investment to the surrounding community.

Westinghouse Electric Company, owner of Springfields Fuels Limited which operated the Preston site, will now have the freedom to invest for the future under the terms of the new 150-year lease, maintaining the high-quality jobs that would otherwise have been gradually shed as commercial operations declined and decommissioning progressed.

Worldwide, Westinghouse provides fuel, services, technology, plant design and equipment for the nuclear industry.

The Springfields site, which currently employs around 1,350 people, has manufactured nuclear fuel since the mid-1940s and was the first plant in the world to provide fuel for a commercial power station.

The transfer concludes more than 12 months of negotiations, and emerged out of an NDA programme which aimed to dispose of surplus assets and maximise income to assist with decommissioning, in line with obligations under the Energy Act 2004. With mounting interest and support

for new nuclear generation, additional possibilities were opened up for a range of assets, including Springfields.

Project manager Michael Glass said the local community had been extremely supportive and added: "The new arrangements will allow the NDA to focus on its core decommissioning and clean-up mission, and lead to a very large reduction – more than 50 per cent - in liabilities at Springfields through the deferral and reduction in decommissioning costs."

He added that the NDA will continue to be involved in future site developments, while a pragmatic agreement had been concluded on contaminated land, with historic liabilities continuing to be addressed by the NDA and future contamination by Westinghouse. A fund will also be put aside to meet those liabilities, thus avoiding any repercussions for the taxpayer.

"It also represents the best opportunity to address both the income potential of the site and the cost-reduction possibilities, as the NDA will benefit from future growth," added Michael.

The deal required Government approval and a change in the legal designation of the site to remove it from NDA's remit.

The success of the deal demonstrates that major energy companies are gearing up for significant investment in a low-carbon future.

Fast track to safety



A flask in transit

Transporting nuclear material by train is a highly specialised activity, carried out in the UK by NDA subsidiary company Direct Rail Services.

Based in Carlisle, DRS also provides a rail freight service to non-nuclear customers across the country, particularly in the retail sector, helping to remove heavy lorries from the congested road network while generating around £45 million a year to support the nuclear decommissioning mission.

With depots around the country and a staff of almost 300 people, including drivers and an engineering maintenance team, DRS is one of a handful of rail freight companies in the UK. Thanks to its nuclear expertise, it is also the most specialised. Formed in 1995 following the restructuring of the railways, it has been part of the NDA since its establishment in 2005.

From the early days where the focus was entirely on nuclear, the business

has diversified to the point where around half its operations are in more general freight services, underpinning the Government drive to encourage more sustainable forms of transport.

Rail is a key mode of transport for the nuclear industry, offering a fast, safe, direct and reliable service, while being environmentally more sustainable than road. Nuclear material has been transported by rail since the early 60s, travelling more than eight million miles without any incident involving the release of radioactive material.

The used fuel is transported in purpose-built flasks, heavily shielded to protect against radiation, each weighing more than 50 tonnes and constructed from forged steel more than 30cm thick.

The flasks are designed to withstand serious accidents such as a crash, fire, even being dropped from a bridge, while safety and security are, of course, strictly regulated. Transport movements also require careful forward planning in order to fit around existing timetables and avoid stoppages.

In addition to developing the non-nuclear freight business, DRS is moving into the passenger market, and has just run a charity day with Northern Rail, in the shape of a special first-class service for enthusiasts from Workington to York. DRS was able to raise £2,400 for its two chosen local charities, out of the £6,000 raised in total.

Following last year's floods which devastated West Cumbria, DRS teamed up with Northern Rail to provide an emergency daily passenger shuttle service connecting the two halves of Workington, which were cut off when the town's road bridge was destroyed. The service, funded by the Department for Transport, ran from Workington to Maryport, was free to customers and proved extremely popular. DRS received an award from the local authority in recognition of its contribution to flood relief.

Investment in learning facilities



Energus, the flagship learning facility in Cumbria

As part of the NDA's Skills and Capability Strategy, the NDA works with partner organisations to support educational facilities, providing both expertise and funding assistance. The aim is to encourage the development of skills at a range of different levels.

Cumbria

A notable early achievement associated with the Skills Strategy has been the establishment of Energus, a vocational centre of excellence for nuclear engineering in West Cumbria.

Energus is also the northwest flagship for the National Skills Academy for Nuclear (NSAN), as well as home to the first presence of the University of Cumbria in the western part of the county.

With £5 million of NDA support and £15 million from other sources, Energus is now fully operational, while further plans are under way for a joint facility with the University of Manchester on the Westlakes Science Park, near Whitehaven, for research and development and higher level skills in specialist nuclear areas.

Wales

Similar moves are under way in North West Wales where a number of funding and support organisations have established the Energy Island Programme that will put the region at the forefront of low-carbon energy developments and learning facilities.

The Isle of Anglesey County Council's vision, shared by a range of stakeholders including the UK Government's Department for Energy and Climate Change and the Welsh Assembly Government, aims to establish the area as a world-renowned centre for low-carbon energy production, servicing and demonstration. Energy efficiency, low-carbon energy developments, nuclear decommissioning, supply chain development, infrastructure enhancement, skills and education development are all important elements of the programme.

To help realise the vision, a £6 million construction programme is under way for a new energy fabrication and skills centre at Coleg Menai, Llangefni, the major further education college serving Anglesey and North West Wales. Supported by a £1.5 million contribution from the NDA, the centre will enable the development of a range of high-quality skills needed to support the local economy in the years ahead.

A collaboration agreement between key stakeholders is currently in the process of being finalised to take this major work programme forward and is due to be signed in September 2010.

South West England

A major boost has also been delivered to Bridgwater College in the South West of England, where a jointly funded Energy Centre is being built with £450,000 of support from the NDA.

The £7.8 million Energy Skills Centre will be a first-class learning facility, designed to meet the growing demand for training in science and engineering from local employers. It will provide the location for the South West regional training hub of the National Skills Academy for Nuclear (NSAN).

The Centre is a key part of plans to deliver the region's economic and skills development objectives. Approximately 60% of the training programme will be dedicated to raising skills in high-technology, knowledge-based industries, while the remaining 40% will support reactor decommissioning and prepare for nuclear new build.

Scotland

And in Scotland the NDA has contributed £2 million towards the provision of an Engineering Skills Centre in Caithness. This state-of-the-art facility will be based at the Thurso campus of North Highland College, a partner in the University of the Highlands & Islands Millennium Institute, and will provide high-quality training opportunities for the north of Scotland's science and engineering sector.

Building work on the £8.95 million project is due to commence very soon. The centre will be equipped with the latest learning technology and equipment ready for opening in time for the 2011-2012 academic year.

The curriculum at the Caithness Engineering Skills Centre will be aimed at maintaining and upgrading the capabilities of local companies as they participate in nuclear decommissioning and diversify into new opportunities, such as the marine renewables industry which is emerging in the nearby Pentland Firth.

A key impetus of the project is to retain young people in the area by providing them with first-rate training in their locality. Trainees will also be encouraged to adopt an innovative and entrepreneurial approach that it is hoped will encourage business start-up and contribute to the economic growth of the region.



The NDA's Dounreay Programme Director Randall Bargett (right) with Eann Sinclair, Programme Manager for the Caithness and North Sutherland Regeneration Partnership and Alan Ogg, a lecturer at North Highland College

Focus on the people we need

Well-qualified, skilled staff are a fundamental requirement for the complexities of decommissioning, a challenge the NDA is addressing with a wide range of initiatives.

One issue for the nuclear industry, which appeared to have a limited future until recently, has been the diminishing skills base as long-serving employees began to retire and the supply chain looked elsewhere for work. Young people consequently tended to overlook careers in decommissioning while the challenge was compounded by a decline in the uptake of science, maths and engineering subjects.

The NDA, with a statutory obligation to develop and maintain skills while helping to tackle socio-economic decline in areas affected by decommissioning, has been working in partnership with other organisations to create the foundations for a world-class workforce. The Skills

and Capability Strategy was launched by NDA Chairman Stephen Henwood two years ago.

The aim is to encourage apprentices, students, graduates and post-graduates into decommissioning, while supporting educational facilities with expertise and funding assistance. The NDA's partners include regional development agencies, local authorities, training bodies, universities, private-sector companies and government departments.

The NDA's Head of People Strategy Nigel Couzens added: "We have aimed to fulfill our obligations under the Energy Act but at the same time, are making a positive contribution to developing skills on a wider basis and attracting people into the industry."

Much of the work of the last few years has been carried in partnership with the Site Licence Companies which operate the NDA's 19 sites, but the NDA and its partners, including site operators and training bodies, have now begun to broaden the scope to develop a more people-focused strategy. This looks in detail at the resource demands across the estate, the current skills base of the 18,000 staff, along with future skills and training requirements, and opportunities for greater collaboration.

Work to date has led to the detailed mapping of the existing workforce skills and job roles against planned demand over the next 30 years.

This has also been made available for use by the National Skills Academy for Nuclear, Cogent, the UK's industry skills body for chemicals, pharmaceuticals, nuclear, oil and gas, petroleum and polymer businesses, and is being used as a model by the Global Nuclear Energy Partnership to measure international resources that are available, a valuable tool as new nuclear developments gather pace across the world.

Another key development, led by the National Skills Academy on behalf of employers and supported by the NDA, has been the *Nuclear Skills Passport* which captures an individual's qualifications, training and skills in a format that is transferable across the nuclear sector with the potential to reduce recruitment and induction timeframes, while matching people more precisely to employment opportunities.

The NDA People Strategy has been developed in partnership with the Site Licence Companies and will become fully integrated in our forthcoming Strategy II.

Pioneering scheme builds all-round skills

A pioneering training scheme that provides new graduates with a unique blend of career-enhancing skills is proving to be hugely popular in the nuclear industry.

Launched by the NDA just two years ago, and backed by 20 partners in the public and private sector, the *nucleargraduates* scheme aims to identify and prepare the industry leaders of the future.

The real innovation is to bring nuclear skills to graduates in subjects as diverse as English and accountancy, as well as disciplines more usually associated with the industry such as engineering, maths and physics.

Carl Dawson, Graduate Programme Manager, explained: "The nuclear world needs people skilled in a whole range of professions, including accountancy, property management and business administration. We developed a scheme to plug what we felt was a gap in the industry, and have been delighted by its success."

To date, 30 graduates have embarked on the two-year scheme, starting in three separate groups, or cohorts, over six-monthly intervals.

There were more than 3,700 applications for the places and the selection process was intense.

The scheme is built around four secondments covering the whole nuclear family, starting out with six months at the NDA before moving on to an NDA site, followed by six months in a private sector company, Government or an industry association and a final spell overseas. All training is to professional standards linked to the individual's own background, with qualifications obtained in, for example, public relations, project management, health and safety, radiological protection, etc.

In addition, all graduates spend time on community projects to give an understanding of how the industry operates in its locality. Projects have included work with credit unions, schools, organic growing initiatives,



Graduates undergoing training

gang projects and even chef work in a fish restaurant in Scrabster.

There are no job guarantees but graduates emerge with solid working experience, good professional qualifications and excellent industry contacts. So far, success has come to all those who have completed the course and applied for jobs within the nuclear sector. Graduates have taken up roles in Sellafield Ltd, Magnox South, Areva, Atkins, Rolls-Royce, Urenco, Alstom, Horizon, Westinghouse and Nuvia.

The scheme has won two national awards, including being named as a top 100 Graduate Employer by The Times newspaper, while other nuclear organisations are proposing to enrol their own graduates on the scheme, or merge it into their own training programmes. Delivery, meanwhile, has been handed over to the NDA's strategic partner Energen. The programme is now sponsored by Rolls-Royce, Sellafield Ltd, Magnox North, Magnox South and the NDA. Places have jumped from ten each year to 28.



Trainee James Forde at Smithfield market

The NDA skills agenda covers all levels of work and training opportunities.

In addition to a graduate scheme, the NDA also supports various schemes to encourage apprentices in the nuclear sector. More details in the next edition of Insight.

‘Opportunity not to be missed’



Alex, centre, on a team building exercise in the lakes

Twenty-five-year-old Alex Stewart, who has an MA (Hons) in Geography from Aberdeen University, was part of the first cohort to successfully complete the scheme. He is about to take up a permanent post as an environmental consultant with Areva Risk Management Consultants in Abingdon, and describes his experience of the scheme as “daunting but exhilarating”.

Alex worked initially for the NDA at Herdus House, then Springfields Fuels in Preston, the Environment Agency in

Oxfordshire and with the URS company Washington River Protection Solutions on the Hanford nuclear site in the US.

“The scheme was very challenging and very different, but for me the benefits massively outweighed those challenges. The training we receive, the opportunities that are made available to us and the chance to work abroad all meant that this really was an opportunity not to be missed,” said Alex.

A West Cumbrian by birth, he is the first of his siblings to go to university and the first to work in the US – but has numerous relatives that have worked in the nuclear industry, and some that still do.

“I did originally think to avoid nuclear, but now I’ve gone the same way! There are exciting opportunities for young people in the nuclear industry and I am delighted to be part of it,” he added.

Strategy development

A chance to shape the future



Tony Fountain in discussion at one of the Strategy workshops

In March, stakeholders at the National Stakeholder Group were given a pre-consultation opportunity to influence the proposed NDA strategy.

The Energy Act 2004 requires NDA to review and publish its strategy every five years. The NDA published its first strategy in 2006 and this is now being reviewed and revised ready for final publication in April 2011.

For more than a year, the stakeholders at the NSG have been helping to develop the next version of the Strategy and this particular meeting had been scheduled

at a timely point in the drafting process, giving stakeholders a final chance to input into the NDA’s thinking before the Draft Strategy is prepared for public consultation.

Most of the agenda time was structured around the key strategic themes that provide the NDA with the biggest challenges – integrated waste management, site restoration and spent fuel.

After two days of detailed and intensive discussions, Strategy Director Adrian Simper said that there had been some excellent learning for the NDA from the meeting and the Authority had got a lot from it. “We will deliberate hard about how to make best use of the feedback,” he added.

The strategy development process will continue throughout the summer with the document planned for a 12-week consultation from the beginning of September. At this time the NSG will again play an important part as a forum to help inform stakeholder consultation responses.

Plutonium storage facility opens



Construction under way

Decommissioning is usually associated with the clean-up and eventual demolition of redundant facilities but construction programmes play an equally important role, particularly in ensuring that radioactive waste is dealt with safely.

Legacy wastes – those left over from the earliest days of nuclear research and power generation – often need to be re-packaged and transferred for safer, improved storage, while old facilities may no longer meet with modern regulatory requirements for waste management. As always, safety is the priority.

At Sellafield, for example, approximately £400-£500 million will be spent annually over the next four-five years on a range of construction projects designed to address issues over the large quantities of legacy wastes held on the site.

The most recent facility to be completed is a plutonium storage facility which opened in May and represents the first major construction project delivered since the new Parent Body Organisation, Nuclear Management Partners (NMP) was awarded the Sellafield Ltd contract just over 18 months ago.

The Sellafield Product and Residues Store (SPRS) is the latest addition to the suite of facilities designed to provide safe and secure storage for nuclear materials on the site.

Built from 36,000 cubic metres of concrete, enough cable to stretch from London to Paris and the same amount of steel as the Eiffel Tower, SPRS incorporates some of the most advanced nuclear security features available.

At the peak of construction, more than 450 workers were employed on site, with many more working on the project since construction started in September 2005.

The project team has also maintained an excellent safety record, achieving a total of more than 1.8 million man hours worked by the construction teams without a Lost Time Accident over a

period of 33 months. This achievement was acknowledged by the Institute of Occupational Safety and Health (IOSH) with a commendation in the 'Best Health and Safety Achievement in Construction' category at their 2009 awards event.

Rebecca Weston, Head of Operating Unit, Plutonium Operations, said: "SPRS is a crucial element in the plutonium management strategy. As such, the SPRS operations team are excited about taking charge of this new facility and working towards safe, active operations, which will enable continued safe and secure storage of plutonium materials on the Sellafield site."

NDA's Dr Ian Hudson, Sellafield Programme Director, said: "The combination of effective delivery and world-class safety reflects what can be achieved by combining the best of Sellafield with the supply chain."

Scotland benefits from funding support



Janette Brown, accompanied by Jon Phillips, Rod Johnston, Chief Executive of Scrabster Harbour Trust and Jock Campbell, Vice-chair of Scrabster Harbour Trust

NDA funding is making a positive difference to Caithness, as members of the board were able to see at first hand recently.

First port of call for Janette Brown, the Chair of the NDA Socio-Economic Committee, and Jon Phillips, NDA Communications and Stakeholder Relations Director, was a meeting with Wick Harbour Authority to see how the NDA's £365,000 funds have been used to develop a marina in the town's harbour.

The marina, which was opened by HRH Princess Royal in September last year, has been a major lift for the town - helping to diversify the harbour and providing a much-needed new income stream for the Harbour Authority.

Next on the list was Scrabster Harbour to see the existing harbour facilities first hand and talk to the Trust about planned improvements.

The Trust has applied for funding of £2 million from the NDA's socio-economic budget as part of a £23 million project to develop the harbour - helping to provide infrastructure which will support the development of wave and tidal energy in the Pentland Firth and Orkney waters.

Finally, a meeting was held with Caithness Chamber of Commerce for a discussion on business and innovation opportunities in the area.

Randall Bargeit, the NDA's Site Programme Director, said: "The NDA is committed to supporting Highlands & Islands Enterprise to help build a sustainable future for the area. Although the safe decommissioning of Dounreay is our main priority, we are working hard to minimise the impact through the identification and support of projects which we believe will have a long-lasting impact and provide local employment opportunities beyond the lifespan of Dounreay."

Site restoration



Weather protection

The installation of the weather barrier over the two reactor buildings at Hunterston A Site is now complete and signifies delivery of an important milestone for the NDA. This has eliminated the conventional safety hazard of falling glass.

The previous weather protection consisted of patent glazing fitted to a structural steel frame over the concrete

building structure. Each reactor building is approximately 60 metres x 50 metres by 60 metres high and contained some 7,000 panes of glass each.

The glazing system was at the end of its useful life and small areas were failing under severe weather conditions, particularly during high winds leading to water penetration.

Approximately 170 tonnes of glass were removed and recycled resulting in £28,000 worth of unexpected income. In addition, around 120 tonnes of steel and 130 tonnes of lead were removed and recycled. Addressing this conventional safety risk enables work to continue on the Scottish site's other decommissioning and hazard reduction projects.

Outline of plans for underground disposal of radioactive waste

NDA has set out details of how it could implement the UK Government's solution to dealing with higher activity radioactive waste through disposal deep underground in a geological disposal facility. This process will be based on a voluntarism and partnership approach.

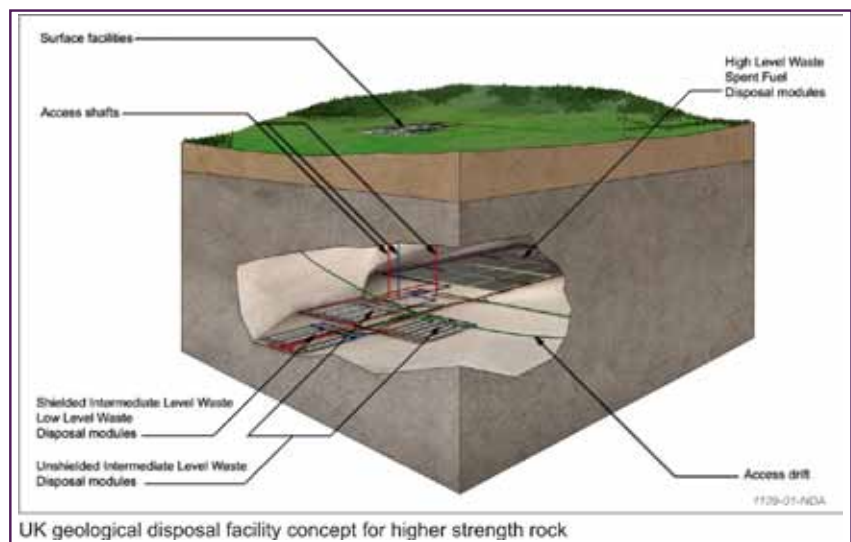
While the UK Government is leading on the site selection process, our scientists and engineers within the Radioactive Waste Management Directorate (RWMD) are considering all the issues which will need to be dealt with to successfully deliver what will be one of the biggest scientific and engineering developments in the UK.

These issues are covered in the newly published *Geological Disposal: Steps towards implementation* report which is now available on the NDA website.

RWMD Managing Director, Bruce McKirdy, said: "We are some time away from construction and operation of a geological disposal facility, but our work also supports the Government's site selection process. This allows us to provide as much information as possible to those communities who are interested in potentially hosting a facility."



Artist's impression of the surface facilities



How the GDF might look

The five steps or phases as outlined are:

- 1. Preparatory Studies** – in this phase our work supports the UK Government and communities who have expressed an interest in participating in the site selection process.
- 2. Surface Based Investigations** – if communities decide to proceed, the UK Government will agree candidate sites for surface-based investigations.
- 3. Construction and Underground Based Investigations** – once UK Government has identified its preferred site and following successful discussions with the local community, we will seek planning and regulatory permissions.

4. Operations – following agreement by the UK Government and regulators the facility would start operations (around 2040).

5. Closure – Once all the waste has been disposed, a decision to close the facility will be taken following discussions with the local community.

Bruce McKirdy said: "We realise our plans are at the very early stage of this programme and that implementation is dependent on the successful working in partnership with potential host communities and with UK Government."