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# INSIGHT

into nuclear decommissioning

NDA

Nuclear  
Decommissioning  
Authority

## UK milestone for reactors

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## Innovative Sellafield solutions

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Dealing with the past. Protecting the future.

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Welcome to the autumn edition of Insight magazine, which highlights progress being made across our estate and celebrates some of our achievements. 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 hearing your views and any suggestions for improving the format.

Comments to the editor Deborah Ward on 01925 802343 or [deborah.ward@nda.gov.uk](mailto:deborah.ward@nda.gov.uk)

Front cover: One of the Berkeley reactors

# Strategy roadshow seeks views

An NDA team has been touring the country to encourage stakeholders to feed their views into the Draft Strategy, published for consultation at the beginning of September.

Presentations to local stakeholder groups at sites in England, Wales and Scotland have allowed the NDA team to engage in face-to-face discussions about various aspects of the proposed strategy.

A concern emerging from the discussions was the potential impact on the Strategy of the funding decisions announced in the Comprehensive Spending Review (CSR).

Bill Hamilton, Head of Stakeholder Relations, said: "Understandably, many stakeholders were interested to know the extent of the potential impact of funding decisions on the Strategy. Our response is that funding impacts the speed with which we can deliver the Strategy but not the direction of travel itself. The impacts of CSR will be addressed in detail when drafting the forthcoming Business Plan which outlines site work schedules from 2011-2014."

Another area of interest emerging is the proposal to consolidate the storage of radioactive waste at a reduced number of sites and the possibility of near-surface disposal of some Intermediate Level Waste at or near existing nuclear licensed sites.

The NDA began reviewing its Strategy in autumn 2009 and has, since then, engaged with many stakeholders, the UK and Scottish Governments and nuclear regulators before producing the Draft Strategy for public consultation.

Published on 1 September 2010, the Draft Strategy conveys the strategic direction for the estate and how the NDA, its delivery contractors and supply chain will tackle the unprecedented challenges over the coming years.

Some key high-level messages include:

- Where the risks to people or the environment are intolerable, addressing these is the NDA's top priority.
- Each NDA site has an agreed Site End State resulting from the 2006 consultation exercise with Site Stakeholder Groups. In addition, the NDA proposes introducing Interim States that define nearer-term, tangible milestones that demonstrate progress.
- The NDA proposes to make best use of estate-wide assets, including co-locating waste storage and treatment facilities and consolidating nuclear materials for reasons of security and where there is benefit to the taxpayer.
- The NDA will apply the Waste Hierarchy, taking account of value for money, affordability and the protection of health, safety, security and the environment. Diverse solutions will minimise waste creation, maximise re-use and recycling and rely on disposal as a last resort.
- The NDA aims to secure and implement the most appropriate management approach for Magnox and oxide spent fuels and, where possible, take advantage of these approaches to manage exotic fuels.

Following the 12-week consultation, the Draft Strategy will be updated, submitted to Ministers for approval and finally published in April 2011 alongside the NDA Business Plan 2011-2014.

The public consultation will close on 24 November. To request your copy of the Draft Strategy, or for any enquiries, send an email to [strategy.consultation@nda.gov.uk](mailto:strategy.consultation@nda.gov.uk)

## Clarity, focus and delivery

After much anticipation and speculation, we now know the outcome of the Spending Review, in headline terms at least. It is very clear to us in the NDA that our Ministerial team at DECC – Chris Huhne, Charles Hendry and Lord Marland, supported very ably by officials - have understood the vitally important task of cleaning up the nuclear legacy and have fought hard to secure a level of funding that will enable significant further progress to be made over the next four years.

On the face of it, we have an increased budget with average annual expenditure looking to be in the region of £3 billion a year. But there is much to understand behind this figure.

The NDA's funding challenge is complex because it relies upon both government grant and commercial income.

Just when the Government is looking to reduce public expenditure, the NDA's ability to generate income is declining, and at the same time we are part-way through a major investment in capital expenditure necessary to ensure the highest hazards in our estate are being addressed. This was not the time to cut back expenditure on such a critical programme and the Government has recognised that.

However, there are other parts of our estate that do not pose the same degree of urgency and we have worked closely with officials, the SLCs and the regulators over the last 12 months to see how we could reshape our programme to ensure that our call on the taxpayer was reduced as far as possible whilst maintaining safety and addressing the priorities.

During this time we have reduced the size of the NDA by around 30%, from 300 members of staff to 210; deferred some non-critical activity into future years; targeted our SLCs to deliver tough efficiency targets, and set ourselves some ambitious targets for generating commercial income.

We will be producing our annual draft Business Plan for consultation over the next few weeks and will set out in that how we intend to allocate the available funds for next year.



Whilst on one hand we should be pleased that we have secured a substantial amount of public funds to progress our mission, on the other the settlement we have received presents us with significant challenges and will require us to make some very difficult decisions about allocating resources.

Our task now is to firm up those plans so that we and our stakeholders have clarity and, through our SLCs, ensure we have complete focus on delivering the programme effectively and efficiently.

## Silicones - a flexible alternative to cement



The materials used to make up the waste simulant (left) and the polymer poured over the top (right)

Radioactive waste destined for the Geological Disposal Facility (GDF) must first be stabilised and rendered as safe as possible. Generally, this means a cement-like mixture is used to immobilise the waste inside a container and the resulting waste package is safely stored until the GDF becomes available.

For most standard wastes generated by the civil nuclear sector, this works well, but there is a proportion of difficult-to-cement materials.

However, a number of polymer-based materials have been developed that now offer a potential way forward for these challenging waste streams.

NDA is able to fund innovative R&D work on common technical needs across its estate through its strategic Direct Research Portfolio (DRP - See [www.nda.gov.uk/research](http://www.nda.gov.uk/research) for further details). Developed by UKAEA and funded by the NDA's DRP, the trialled silicone polymer-based materials are similar to the flexible silicone sealants used in

other industries such as construction and electronics – even DIY.

The trials have established some potential advantages of the silicone materials over cement-based encapsulants for certain wastes including less potential for corrosion, cracking and leaching.

Extensive tests were carried out, where the rubbery material was poured directly on to simulant wastes and left to set, as well as dropping silicone-grouted waste-filled drums onto a concrete floor to assess their ability to withstand high impacts. The simulant wastes included graphite and metal, varying in size from powder to large blocks with complex shapes.

Both sets of tests proved successful: the silicones required no stirring and covered the waste surfaces efficiently, while the waste in the dropped drums remained intact despite the high impact, cushioned by the flexible encasing.

Initial radiation tests using an external radiation source also gave promising results with the silicone polymer slowly changing to a more glass-like material.

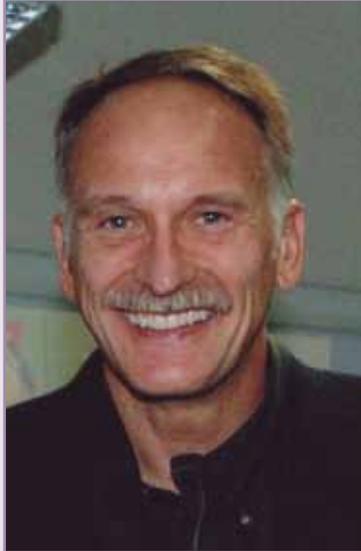
Dr James McKinney, NDA technical sponsor, said: "These silicones show excellent potential as waste encapsulation material for difficult wastes across the NDA estate. We hope the trials continue to progress well."

Further NDA-supported work is now planned in conjunction with the SLCs in order to define how widespread the application of silicone polymers could be.

If you would like more information on this project please contact Dr Darrell Morris, NDA Research Manager, on 01925 802256 or [research@nda.gov.uk](mailto:research@nda.gov.uk)

## Directors appointed

Two new Executive Directors are joining the NDA.



Mark Lesinski has been appointed as Executive Director, Delivery. Mark has more than 30 years experience in the nuclear industry, holding senior roles in both the US and UK. He joins from Magnox South Ltd where he has been Managing Director since early 2008.



David Batters has been appointed Chief Financial Officer. David, a Chartered Management Accountant, joins the NDA from BAE Systems where he has held a variety of roles over a 22-year period, both in the UK and overseas. His most recent role was Director of Group Mergers & Acquisitions.

## Research and development

### £4 million funding for research projects

A fund of £4 million for research projects to help develop a Geological Disposal Facility (GDF) attracted wide interest when a call for expressions of interest was published recently.

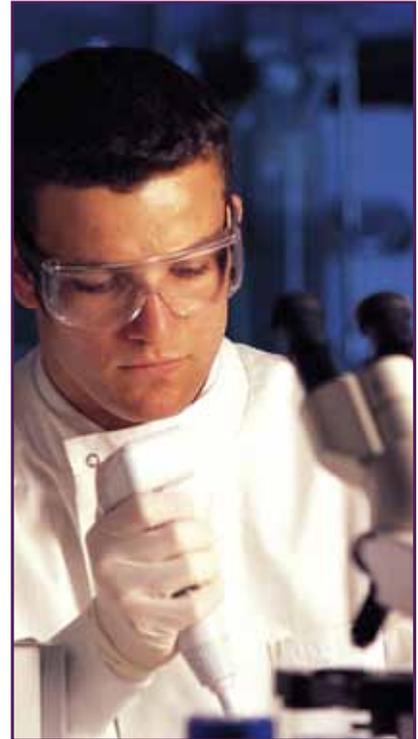
The GDF will be the final home for the UK's higher activity radioactive waste and which, for planning purposes, is assumed become operational around 2040, once a location has been selected and a detailed design approved.

Following the invitation to express interest, 30 delegates took part in a recent workshop to draft a list of potential areas for extensive research.

More than 70 responses were received and 30 applicants, representing a range of expertise and academia, were invited to the workshop, which was also attended by observers from the Government's Committee on Radioactive Waste Management (CoRWM) and the nuclear regulators.

The funding is being jointly made available by the NDA's Radioactive Waste Management Directorate (RWMD) and the Research Council Energy Programme.

Following an invitation to appropriate research organisations for expressions of interest in July, Neil Smart, RWMD's Head of Research, said: "The workshop



Research projects will help to develop the GDF

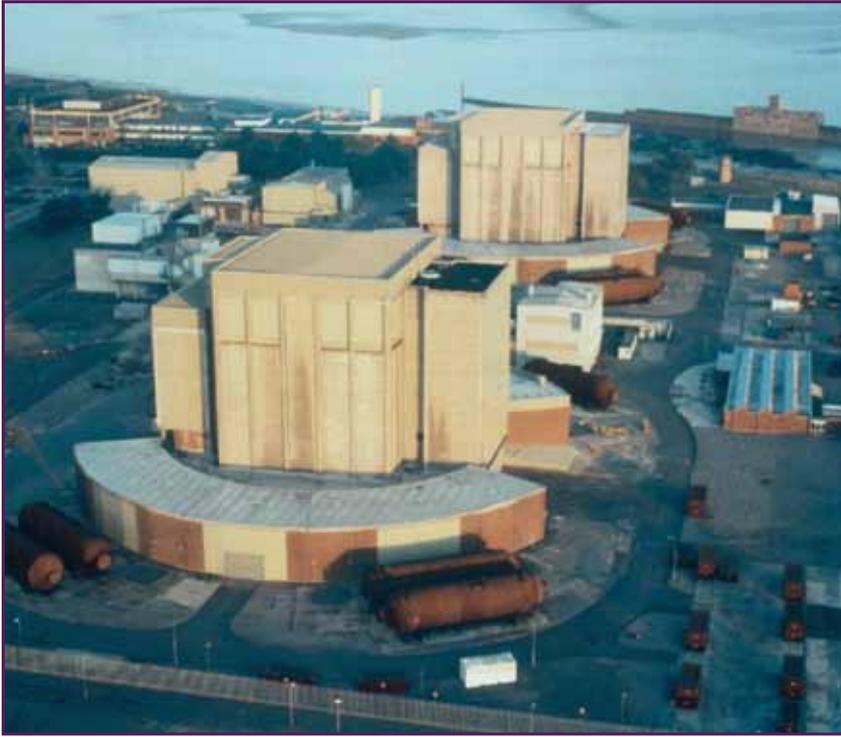
focused on four thematic areas: waste package behaviour, gas, the engineered barrier system and radionuclides.

"These areas were considered to have the most potential to yield important information."

The workshop resulted in the submission of 11 outline proposals, with eight of them invited to submit more detailed proposals to the Engineering and Physical Sciences Research Council (EPSRC) by 23 November 2010. After a detailed evaluation process, the funding allocations will be decided next February.

Stephen Elsby, Senior Sector Manager, Energy at EPSRC said: "These projects will bring together the research excellence of the UK academic base with the real-world challenges associated with a Geological Disposal Facility (GDF). They offer direct benefits to UK science and the realisation of a GDF."

## UK first for reactors



The two reactors will be sealed up

In a first for the UK, Berkeley site has completed all the work necessary to close both its reactors and place them in a passive state, known as Safestore, until the site is finally cleared in around 60 years time.

Constructed in 1957, the Magnox reactors are two of the UK's oldest and the world's first purpose-designed to produce commercial nuclear energy.

Regulatory approval is currently awaited to 'passivise' the buildings, with a closing event scheduled for December to mark the milestone.

The reactor Safestore programme, started in 1993, is one of the site's largest projects in preparation for the period of Care and Maintenance, when all major decommissioning work is complete.

This will leave only a waste store and the reactors on site to be monitored and maintained until final dismantling in 2074. At this point, the level of radioactivity from the Reactors will have dropped sufficiently to enable human access and the waste store will have been emptied to the deep Geological Disposal Facility (GDF).

Since the project started in 1993, the reactors have undergone major changes, including an 80ft height reduction, removal of the primary gas circuits and the lowering of all 16 boilers.

More recent work has included the removal of all redundant equipment, preparation of the reactor vessels and the isolation of power supplies.

Sean Sargent, Site Director, said: "I am extremely proud that the world's first commercial reactors will be placed into Safestore while I am Site Director. This has been a major piece of work achieved by an excellent team and I am sure they will continue to show the same dedication to get the remaining projects completed so that the site can move into Care and Maintenance."

The site is now focused on remaining decommissioning projects including the management of the legacy Intermediate Level Waste held in the site vaults and the removal of all redundant ancillary buildings.

## Flexible approach is key to waste challenge

An integrated ILW Programme is now in place both across Magnox South and Magnox North as part of the 'Programmisation' strategy that has seen the establishment of specialist mobile teams to address different challenges across the estate.

Safe retrieval and storage of ILW is key to enabling sites to enter the Care and Maintenance period, where the major elements of work are complete and the reactors are maintained and monitored over a period of years until they can be dismantled and the contents eventually transferred to the GDF, when it becomes available.

ILW comprises a range of material including debris from the fuel elements, resins, sludges and graphite.

John Grierson, MXS Director of ILW Management, explained that, potentially, the deployment of GNS Yellow Boxes rather than purpose-built on-site shielded stores could provide significant cost savings to the programme and provide greater flexibility.

"There are real benefits in the more flexible approach that GNS Yellow Boxes would bring, in particular the ability to target the waste stream more precisely and avoid major up-front costs before bringing the waste out, as well as real cost savings," he added.

## Waste to emerge from underground vaults



Staff prepare waste for retrieval

The radioactive contents of a series of underground vaults at Berkeley are scheduled to be brought to the surface over the coming years and put into safe storage, marking a key milestone in the extensive preparations needed to clear the site.

Berkeley was one of the first nuclear power stations to stop generating, in 1989, and in the following three years removed all its spent fuel which represents the vast bulk of radioactive hazard. But more than 90% of the site's remaining radioactive waste has been kept for decades in four vaults, dating from 1957, and posing a special challenge because of the unusual range of material.



Waste has been in the vaults for years

"Our waste is, basically, a unique mixture," said Retrieval and Commissioning Manager Jim Payne. "Alongside the operational waste from the power station, which most sites have to deal with, we also had experimental material from the neighbouring research labs, working on the next generation of Advanced Gas-Cooled Reactors."

Site director Sean Sargent added: "Some of the material has degraded over the years, and no-one has so far been able to tackle the problem. Hopefully, though, we are now tantalisingly close to a solution – and that seemed a distant dream just 12 months ago."

The original plan, in common with many other decommissioning plants, was to construct a shielded store on site for Intermediate Level Waste (ILW), then encapsulate the vault material in concrete and transfer the container into the store. The permanent destination would be the UK's deep Geological Disposal Facility that is being developed and is due to be operational around 2040.

The aspiration now, however, is to use the GNS Yellow Boxes and cylindrical MOSAIK® (MiniStores) containers that have been successfully trialled at Dungeness and offer a far more flexible solution. Costs can be spread over time, for example, and while a store would still need to be built, simple weatherproofing would be the main requirement rather than sophisticated radioactive shielding.

Research has been ongoing at Berkeley since April and samples from two of the vaults have been sent for analysis. If approval from the regulatory authorities is forthcoming, work will start on filling the MOSAIK® (MiniStores) container that was recently delivered to site.

The two-year research and development period requires close working with the regulators, and will, subject to consent, pave the way for the major retrieval work.

Meanwhile, work has been completed on the foundations for the ILW storage building, which can be adapted in the years ahead for whichever kind of shielding is needed.

"The original solution was estimated to cost £255 million, with £155 million of that just to get the first box of waste out. MiniStores will allow us to reach that first box stage for £32 million and to phase costs over time – it offers a pragmatic and affordable way forward," added Sean.

# Seabed exploration to retrieve particles

A floating platform anchored off the Dounreay shoreline is using a remotely operated underwater vehicle (ROV) to track down fragments of nuclear fuel buried in the seabed.

The mission to find the particles, which were discharged during the 60s and 70s, began in 2008 and has just drawn to a close for 2010.

Located 600 metres offshore, the ROV has been searching an area equivalent to 17 international football pitches over the summer months and follows a smaller-scale clean-up last year, when more than 300 particles were recovered.

This year's operation is using a larger ROV with a wider scan and is controlled from an offshore platform with its own living quarters, instead of a small workboat.

A team of 22 staff from contractor Land and Marine and radiation specialist Nuvia is working round-the-clock shifts on board the 60-metre long barge, deploying the ROV – the size of a small bulldozer - in water up to 30 metres deep from an onboard control room.

The radiation detectors attached to the ROV are an underwater version of the system developed by Nuvia and used routinely to monitor beaches near Dounreay.

"This is a step up from previous offshore recovery operations and underlines our determination to get on with the clean-up of the seabed as part of the site closure," said Bill Thomson, project manager at

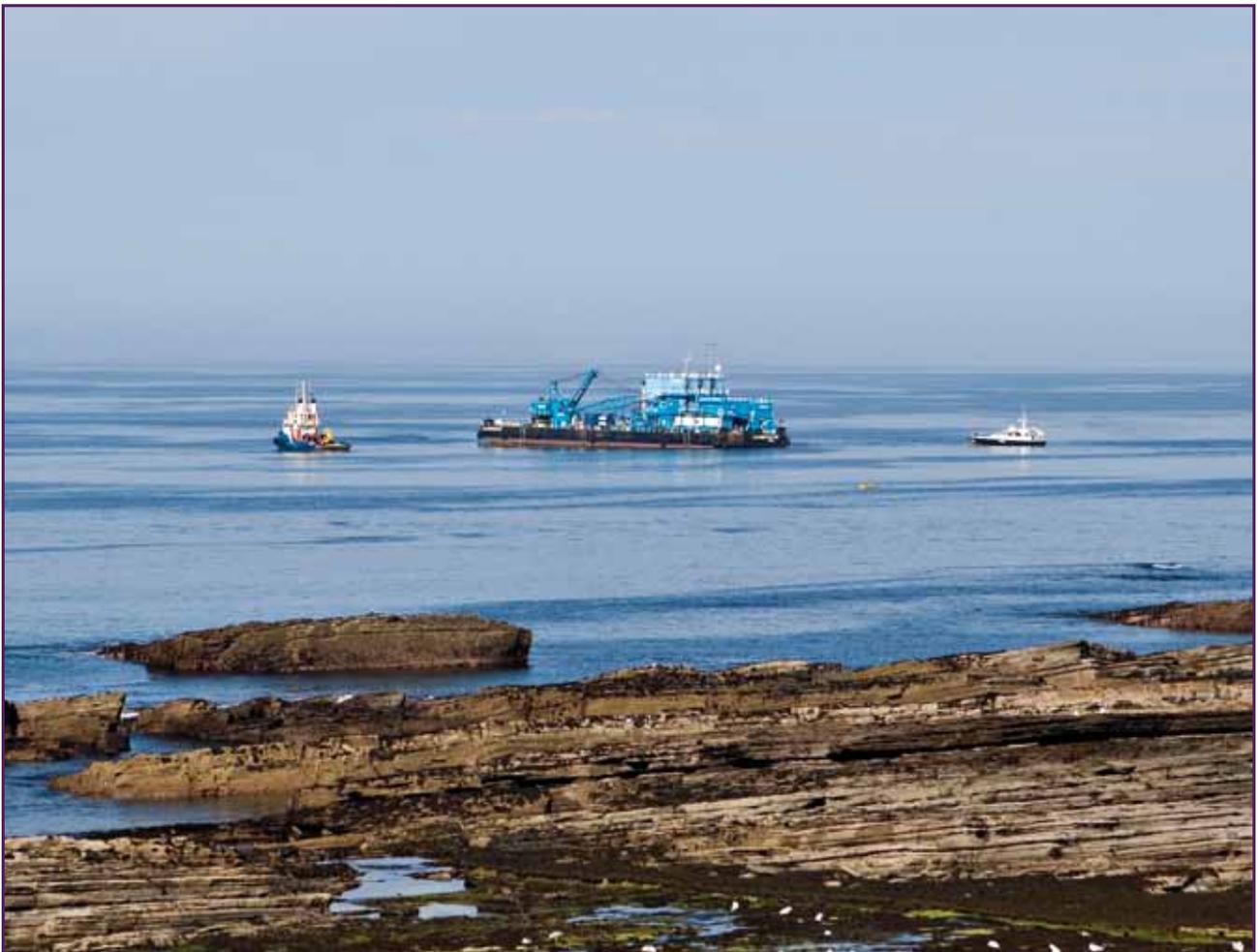
Dounreay Site Restoration Ltd (DSRL), the contractor cleaning up the site on behalf of the NDA.

The seabed pollution has been traced to discharges from the site at the height of nuclear fuel reprocessing, located near the old discharge point, and is believed to be the source of smaller particles detected routinely on local beaches. Fishing has been prohibited in this area since 1997.

The start of seabed clean-up followed extensive research and public consultation about the best practicable environmental option for dealing with the legacy.

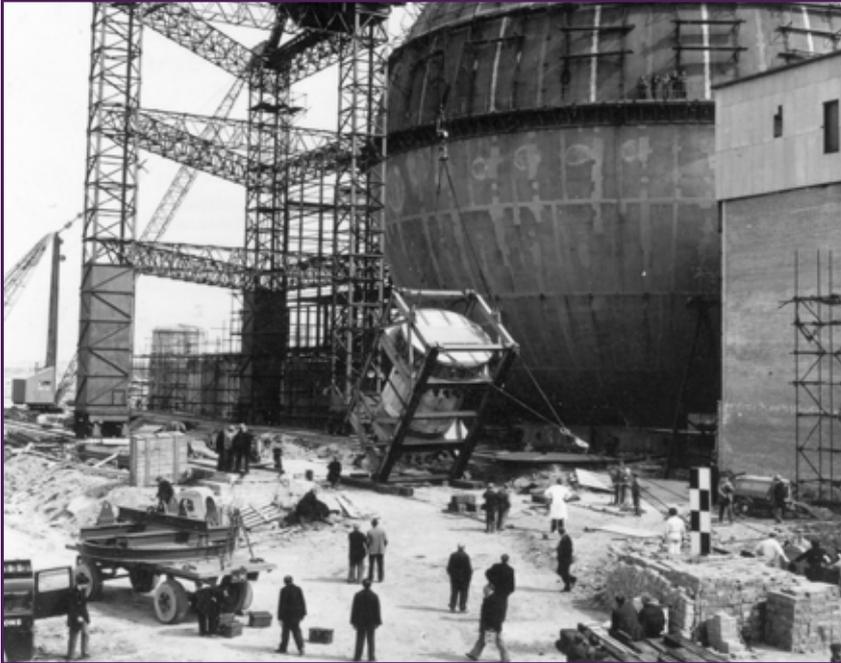
DSRL is working with independent experts appointed by the Scottish Environment Protection Agency to assess the effect of seabed clean-up.

The total cost of site clean-up is an estimated £2.6 billion.



# Dounreay legacy

How to preserve the legacy of Dounreay, site of the UK's unique experiment with fast breeder nuclear reactors, for future generations?



The iconic sphere under construction

The issue has been exercising the collective thoughts of local community and interested stakeholders in the north of Scotland for a number of years.

Dounreay, built in the 1950s but in the process of decommissioning since 1994, has had a huge impact on the surrounding region for generations, and many of the site's distinctive features have become embedded in the local landscape.

Although many have already been demolished and most of the rest, such as the famed sphere, are also scheduled to be flattened, a strategy has been launched setting out how the site's historical significance will be recognised.

The strategy took two years to develop, with input from local community members, and aims to preserve artefacts from the entire site. It marks a first for a nuclear site and may be used as a benchmark for other decommissioning plants.

The 80-page strategy identifies what can be kept for future generations, including uncontaminated items of technology, historical records,

photographs, and recorded interviews with workers past and present.

Some of the buildings, including the sphere, still contain major nuclear and chemical hazards and will be retained in the short term. But the strategy rules out their preservation once the hazards have been removed and the buildings have no useful purpose.

DSRL will work with an advisory panel drawn from Historic Scotland, the Royal Commission on the Ancient and Historical Monuments of Scotland, National Museums Scotland and Caithness Horizons, a registered museum in Thurso, to identify and preserve aspects of the site.

Other ideas that will be explored include an international conference on nuclear heritage, a national exhibition dedicated to Dounreay, an academic study of the site's significance and a lasting memorial where the site once stood.

DSRL expects to take at least another two decades to complete the clean-out and demolition of the remaining facilities, with the sphere likely to be one of the last facilities removed.

# Magnox merger under way

Plans are well under way for the merger of Magnox North and Magnox South into a single company operating all but one of the UK's Magnox nuclear sites (Calder Hall was the first Magnox reactor and it is located on the Sellafield site).



The two businesses have operated successfully as separate entities for almost three years.

Parent company EnergySolutions LLC has proposed the re-integration as part of its response to the NDA's challenge to concentrate funds on reducing hazards at the 10 Magnox sites, which are owned by the NDA.

It is expected that the re-integration will generate significant financial savings through reduced overhead and support costs, and allow funds to be focused on the nuclear clean-up mission.

The NDA has agreed to the move, which is also subject to approval from the regulatory authorities.

Formal constitution of the new company, Magnox Ltd, is due to be complete by the end of the year, while further changes will be implemented during the course of 2011.

# Innovative solutions tackle site challenges

One of the most critical projects currently underway at Sellafield site is the construction of Evaporator D. It will deliver a new highly active liquid evaporator to support reprocessing operations and meet commitments to reduce levels of highly active liquor, processing it into a safe solid glass form suitable for long-term storage.

With a nuclear site as complex and compact as Sellafield, any construction projects can be extremely challenging for the contractors. This is certainly true for Evaporator D which requires many innovative solutions to be found by Costain, the main contractor, to overcome those challenges.

The evaporator's location is a challenge in itself as it is to be sited on a very small footprint with existing evaporation facilities on one side, a chemical tank farm on the other, and an adjacent rail line bringing spent fuel for reprocessing.

These constraints have led to some innovative construction and fabrication methods, many of which are being carried out for the first time at Sellafield. They have provided an impetus for changing the routine way of constructing plant.

Due to the lack of space on site, the evaporator itself is being assembled in modules off site at Ellesmere Port. The contract for this work was awarded to Interserve and will allow for better quality controls in a factory environment. The modules will then be transported in large pre-assembled units, ready to be slotted into the concrete and steel shell of the building.

Most of the modules are too large for road transport so they will be brought by barge from Ellesmere Port to the beach adjacent to Sellafield. The contract for the transport and shipping element of module delivery was awarded to Mammoet UK Ltd.

A self-propelled modular vehicle will then transfer the modules from the barge onto the site, requiring modifications to the beach area, a temporary bridge across the River Ehen, strengthening the railway crossing and modifications to the railway station access road.



The cranes are designed to fold down when not in use

The modules will be brought to the site as soon as they are assembled and stored until they are required. This will enable the team to choose the best weather window for the transfers without delaying the project.

Safety has been a high priority throughout and 500,000 man hours were reached in November 2009 without a lost-time accident. The Evap D Project has seen many other milestones reached, starting with the sanctioning of the project by DECC in record time.

Construction of the building foundations began in May 2009 with the first concrete pour of the raft foundation achieved several days ahead of time and the final foundation concrete pour took place in August 2009. Despite a challenging schedule, the overall project remains on target to be completed and operating by July 2014.

## Innovation

One of the many challenges faced by Costain was managing the potential risk to nearby facilities during construction. This meant that conventional tower cranes could not be used. In their place, Speirings Self-Erecting Tower Cranes were identified as the most suitable alternative. These have their ballast close to ground level and unfold to look rather like a 'Preying Mantis'.

## Safety story

In November 2009, the project team achieved 500,000 man hours without a single first-aid case. As part of the celebrations, a cheque for £5,000 was presented to the Cumbria Flood Recovery Fund by Charles Sweeney, COGAP, and Fran Williams, Sellafield Ltd. This fund was nominated by the project employees.

## Building modules off site

For the first time in the history of the Sellafield site, large-scale modules will be built off site and then transported in and lifted into

position by a gantry system. A total of 14 modules will be assembled by Interserve at a facility near Ellesmere Port, the heaviest being the evaporator cell weighing 530 tonnes and measuring 30 metres by 8 metres by 12 metres. Eleven of the modules are too large to be transported by road so will be brought 55 miles by sea on barges.

## The port

To enable barges to deliver pre-assembled modules to the site at Sellafield, modifications have to be made to the beach area. This involves laying a temporary ramp on the beach, cutting through a spit of land and then building a temporary bridge across the River Ehen to withstand heavy loads. Further modifications are required to allow the large self-propelled modular transporters to pass over railway lines, minor roads and through the Sellafield Site infrastructure. On site, a number of obstacles need to be removed ranging from road signs and bus shelters to an overhead pedestrian walkway that connects two buildings.



Above: Preparations are made for the temporary bridge  
Below: Testing the barge delivery plan



# New vault now open

## A new state-of-the-art vault for storing low level radioactive waste has opened at the NDA's Low Level Waste Repository near Drigg in Cumbria.

Vault 9, designed to meet the stringent requirements of the UK's nuclear and environmental regulators, can hold 110,000 cubic metres of waste and, combined with the seven trenches and Vault 8, takes the total capacity of the repository to approximately 800,000 cubic metres. Most of the UK's LLW is disposed of at the NDA's repository, which is a vital national asset.

However, there will still be insufficient space to deal with the amount of LLW forecast to arise over the long term and, moving forward, the emphasis is switching from straightforward disposal, which uses up capacity at the LLW Repository, to more effective strategies that include recycling and generating less waste.

This is in line with established environmental principles of the Waste Hierarchy, which provides a priority order for how all waste should be managed, including conventional household rubbish, based on reducing the environmental impact of waste management. Briefly, this places waste prevention at the top of the hierarchy, followed by re-use, recycling and, finally, disposal as the last option.

Dr James McKinney, NDA's Head of Integrated Waste, said: "Having this new vault in operation is vital. Without Vault 9, important nuclear clean-up programmes and operations would simply stall."

A particular feature of the Vault 9 project was the decision to ensure that the vast majority of construction materials were delivered to the site by rail rather than road. This reduced the number of potential road deliveries by 27,500 as more than 98% of all construction materials were brought to the site by, using NDA subsidiary, DRS.

# A less wasteful approach

A UK strategy for dealing with the large volumes of Low Level Waste (LLW) has now been published by the NDA.

The first of its kind, the UK Strategy for the Management of Solid Low Level Radioactive Waste (LLW) from the Nuclear Industry follows a consultation period with a range of stakeholders and reflects the Government's 2007 policy for managing solid Low Level Waste.

LLW accounts for 90% of the total bulk of UK radioactive waste but contains only a tiny fraction of the radioactivity associated with higher activity wastes. Unlike High Level Waste (HLW) and Intermediate Level Wastes (ILW), LLW does not normally require special shielding during handling or transport. LLW generally comprises metals (redundant equipment), soils, building rubble and organic materials (mainly paper towels, clothing and laboratory equipment that have been used in areas where radioactive materials are used – such as hospitals, research

establishments and industry); all of which arise principally as lightly contaminated miscellaneous scrap.

Managing LLW effectively is vital for the nuclear sector, both decommissioning and new power generation, as well as for other producers such as hospitals and universities, particularly in light of the finite capacity of the Low Level Waste Repository (LLWR) near Drigg in Cumbria. The LLWR is the only such facility in the country and, in the past, has been the default destination for most of the UK's LLW material.

The strategy, drawn up in close collaboration with LLWR Ltd, targets better application of the Waste Hierarchy to reduce amounts of solid LLW generated and reduce reliance on disposal. Other key themes are to make the best use of existing LLW management assets and emphasise the need for new fit-for-purpose waste management routes for candidate types of waste within this broad category of waste.

The NDA believes that the tools and technologies for management of LLW are largely available, although innovation may be required in

applying them in the nuclear industry or at individual sites where they have not previously been used.

A management plan has also been developed outlining a programme of initiatives to ensure delivery of the strategy in the most cost-effective way.

Joanne Van Straaten, National Programme Delivery Manager - Waste, said: "The consultation told us that people want to reduce the environmental impact of LLW management, reflecting the way other waste producers manage wastes, by reducing reliance on disposal.

"Based on stakeholder feedback, we are confident that the final strategy better addresses people's concerns, and provides guidance on how to make effective waste management decisions."

The principles outlined in the strategy are being actively employed by waste producers across the UK and the benefits of applying the Waste Hierarchy are being realised. The NDA will continue to provide strategic leadership with regard to its implementation.



Low Level Waste includes redundant metal

## New ship docks in home port



The Pacific Egret arrives in Barrow

The nuclear cargo ship Pacific Egret has docked in its home port of Barrow-in-Furness for the first time, the second of three new UK-flagged vessels that will transport nuclear fuel and waste between Europe and Japan over the next two decades.

The £30 million Pacific Egret will now undergo a period of fitting out and trials before entering full service in 2011. It joins three other vessels in the fleet owned by Pacific Nuclear Transport Ltd (PNTL), a subsidiary of International Nuclear Services (INS), which is owned by the NDA and is the world's leading shipper of nuclear materials.

The Pacific Egret is designed and licensed to carry nuclear cargoes, particularly mixed oxide fuel (MOX) including irradiated fuel or high-level

radioactive wastes. Its sister ship, the Pacific Heron, launched in 2008, was also designed specifically to carry mixed oxide fuel (MOX) to Japan and has just completed its second successful voyage. Pacific Heron and Pacific Egret will be joined later in 2010 by the Pacific Grebe.

Alastair Brown, INS's operations director, said: "The UK has a world-class expertise and a 40-year heritage in the safe and secure transport of nuclear material.

"The arrival of Pacific Egret represents the continuation of that heritage and the reinforcement of that expertise in Barrow-in-Furness, which will enable INS and PNTL to continue to fulfil their contracts with customers in Japan for the next two decades."

The programme of new vessels for INS has so far seen the decommissioning and recycling of the Pacific Teal and the Pacific Crane and the European Shearwater.

INS is the NDA's commercial agent, tasked with managing existing fuel cycle contracts that the NDA has with customers as well as developing new business to optimise value from the NDA's assets. It also provides transport solutions for customers around the world.



The NDA supports apprentices across the estate

### Earn and learn for apprentices

Hundreds of talented young people are entering the nuclear workforce through apprentice schemes that provide on-the-job training and first-class qualifications for the future.

Across the NDA estate, around 150 apprentices, many of them school leavers, are recruited each year and supported during courses typically lasting up to four years. More than 400 are now at various stages of training, a figure that has been climbing over the last few years.

NDA's Head of People Strategy Nigel Couzens said: "There is an urgent need to close the skills gap going forward, and there is a high demand for craft-related skills. The average age across the NDA estate is 45-50, so we are very committed to encouraging and supporting the uptake of apprenticeships, and provide funds for this as a key part of the budget for each site."

Funding from the NDA is now worth a total of more than £8 million a year, spread across the Site Licence Companies. There is commitment from NDA board level down to supporting apprenticeships, highlighted in the Skills and Capability Strategy as well as the new People Strategy.

In addition, the NDA has contributed a further £2 million to the Community Apprentice Programme that is being delivered by the National Skills Academy for Nuclear.

This targets smaller companies in the nuclear supply chain, which may have limited resources to fund apprenticeships. Approximately 100 young people are progressing through courses with businesses in the supply chain.

The NDA is also aiming to work towards an industry-wide programme where apprentices can transfer to other nuclear sites, ensuring a future workforce that is mobile and flexible, able to switch between sites wherever the need is greatest.

Apprentices, generally taken straight from school, spend a year of formal college training, followed by practical on-site work with spells at college and a formal, nationally recognised qualification at the end of the apprenticeship.

Apprentices can qualify as electrical and instrumentation technicians, electricians, mechanical fitters, fabricators, welders, control system technicians, mechanical and electrical design engineers, scientific analysts, nuclear operations and decommissioning workers. Qualifications can also be nuclear-focused, allowing for flexibility in future careers.

Once trained, other careers paths can also open up and many apprentices go on to degree courses and promotions to higher positions within the industry. In West Cumbria,

the NDA has also begun to support apprenticeships in administration – capable administrators are essential to smooth business operations.

Sellafield Ltd, the largest employer of apprentices in the NDA estate, delivers its apprenticeships through training provider Gen II, a private-sector organisation located at five sites in Cumbria, with the largest engineering centre at Energen.

Forty apprentices have recently completed their schemes and have moved into full-time positions with the Company and approximately 230 apprentices are currently undergoing training.

Sellafield Ltd, awarded the prestigious Macro Employer of the Year accolade at the National Apprenticeship Awards 2010, is also looking into the new Higher Apprenticeships in order to accredit some of their existing trainee schemes.

More than 98% of GEN II apprentices move on to full-time work, with most of the nuclear apprentices staying in the industry. And in recent years, more and more girls are opting for work in fields previously dominated by men – an impressive 21% of the GEN II learner intake this year was female, against a national average of just 3%.

At Dounreay, Scotland, meanwhile, 24 young people, including a female instrument technician, are at various stages of their courses. For the first year, the apprentices will attend the North Highland College in Thurso on a full-time basis to gain a National Certificate in engineering.

They then spend three years on site carrying out practical training, backed up by academic work on day release. By the time they qualify, they will have achieved a broad range of engineering qualifications, together with qualifications in their chosen trade.

At Magnox North, a total of 30 apprentices are working on the five sites, of whom 11 are employed through consortia involving local colleges and/or the supply chain. A further four apprentices have recently completed apprenticeships at Hunterston in Scotland, while Magnox South has just taken on two new electrical apprentices at Sizewell and has seen three administration apprentices coming to the end of their time.

## Passport to a skilled future

### The Nuclear Skills Passport is being launched this autumn to set new standards in training and career progression.

Developed over three years with support from nuclear employers, the web-based Nuclear Skills Passport recognises both internal and external skills development and training, delivered to agreed standards, across the nuclear industry and across individual sites.

All nuclear organisations will be offered instant secure web access to information on their nuclear skills base, with a detailed overview of the training completed by their workforce.

Employers have worked with Cogent (the UK industry skills body for chemicals, pharmaceuticals, nuclear, oil and gas, petroleum and polymer businesses) and the National Skills Academy for Nuclear to agree the National Nuclear Industry Training Standards which are recognised, via the Nuclear Skills Passport, across the country.

At an individual level, the Skills Passport will record all relevant training and skills development, allowing staff to take their record to different employers, updated with new skills and with access to information needed to plan further career moves or additional skills development.

For employers, the Nuclear Skills Passport provides assurance on skills and experience, while allowing skills

gaps to be identified and training to be planned. Contractors, meanwhile, will be able to demonstrate the competence of their workforce in tenders.

Jean Llewellyn, Chief Executive of the National Skills Academy for Nuclear, said: "Nuclear working isn't a different skill – it's all about employing other relevant skills in a nuclear environment. In the Nuclear Skills Passport we have agreed training standards and job roles which span across the whole industry. This scheme provides a visible route into other areas - such as new build - but it will also make it easier to retain skills at decommissioning sites for as long as they are needed."

The NDA and its SLCs have been closely involved with developing and introducing the Nuclear Skills Passport, now in the process of being rolled out.

Shortly, the industry will also see the roll-out of the Triple Entry Bar, the first set of standards recognised via the Nuclear Skills Passport System and developed at the request of industry leaders seeking an 'entry bar' for individuals requiring unescorted access to a nuclear site.

The Triple Entry Bar, comprising three training standards, provides individuals with WHAT is required for 'compliance' to enter a nuclear site, an awareness of WHY they need to comply and HOW they need to behave to promote a nuclear safety culture.

For further information, contact the Skills Academy: 01900 898120, [enquiries@nuclear.nscademy.co.uk](mailto:enquiries@nuclear.nscademy.co.uk) [www.nuclear.nscademy.co.uk](http://www.nuclear.nscademy.co.uk) and [www.nuclearskillspassport.co.uk](http://www.nuclearskillspassport.co.uk)

The screenshot shows the 'Skills Passport Holders' page on the Nuclear Skills Academy website. At the top left is the logo for 'The National Skills Academy NUCLEAR'. To the right, there are links for 'Home', 'Skills Passport Holders', and 'Training record'. Below the navigation is a search section titled 'Skills Passport Holders' with the instruction 'Please enter the Skills Passport holder's card number, or name and organisation.' There are three input fields: 'Card number', 'Name' (with 'Alan Jones' entered), and 'Organisation'. A 'Search' button is located below the 'Card number' field. On the right side of the page, there is a box titled 'In this section' with a sub-heading 'Find Skills Passport Holders' and a brief description: 'Find Skills Passport Holders by typing their name or card number into the search box.'

Nuclear Skills Passport: Instant secure web access to a nuclear database

## Wylfa powers on

Almost 40 years ago, Wylfa Power Station on Anglesey became the last and largest Magnox plant to start generating electricity.



Wylfa will carry on generating electricity

Scheduled for planned closure this year, an extension to Wylfa's operational life of up to two years has just been approved, bringing vital revenue to the NDA in support of decommissioning activities across the UK, as well as contributing to the local economy in North Wales.

In the past financial year, 2009-2010, Wylfa earned more than £200 million in revenue and it is expected that the extension to Wylfa will generate further revenue in the region of at least £100 million, income that will be critical as public funding is squeezed in every sector.

At 980MW output, Wylfa meets more than 40% of Wales' electricity needs and, on a typical day, supplies enough electricity to meet the needs of a city twice the size of Liverpool and Manchester combined, at 23 million kilowatt hours.

It employs more than 500 staff and contributes millions of pounds annually to the local economy, through direct employment and contract work for local businesses in the supply chain.

As the most modern of the Magnox fleet, Wylfa incorporates design features that were, at the time, cutting-edge and, consequently, radioactive doses during decommissioning are anticipated to be lower than at other Magnox sites.

Among the new developments were spherical pre-stressed reinforced concrete pressure vessels surrounding the reactors and one of the most sophisticated control systems, with all routine control operations from a single central control room.

Not only this, but Wylfa was the first nuclear site to store its spent fuel in a low-pressure CO<sub>2</sub> atmosphere – dry – rather than the cooling ponds which are standard at other Magnox sites and which form a challenging part of decommissioning.

The NDA's approval for continued generation follows exhaustive work over the last 12 months to ensure all necessary parts of the ageing plant are maintained, repaired or replaced in order to continue operating efficiently, while a number

of safety enhancements have been implemented, long-term spares ordered and all safety cases and documentation are in place.

Extra technicians have also been recruited to replace likely retirees and ensure the right mix of skills and experience remain available to run the plant.

Moving forward, innovative ideas on optimised use of the remaining fuel – the manufacture of Magnox fuel has ceased – are now being looked into, with the potential to extend the life of the station even more.

Station director Nick Gore: "This news marks a major milestone for Wylfa and this has been achieved as a result of 39 years of outstanding operation and maintenance, as well as excellent safety case management.

"I would like to thank everyone at Wylfa for their contribution. This includes station, agency staff and our contractors, plus our colleagues in Engineering, Waste, Strategy and Technical branch (EWST)."