

Special Edition - Financial Year 2009/2010 Highlights

A good year

2009/2010 has seen strong progress in the decommissioning and clean-up agenda across our 19 sites.

From Dounreay on the north coast of Scotland to Dungeness on the south coast of England, and from Wylfa in Anglesey to Bradwell in Essex, performance against plans has been good.

This gives us confidence that having put the right plans and resources in place we are starting to see real delivery across our estate, and I would like to congratulate those involved.

It's been another good year in terms of HSSSE performance on our sites, building on our work to encourage the leading, learning and sharing of good practice across the estate. Strong health and safety records have been maintained with several sites achieving awards in this area.

Whilst we will report in detail through our Annual Report and Accounts later this year, we are pleased to be able to share with stakeholders the encouraging signs of progress in our mission.

During the year we have seen:

- reductions in hazardous materials at Sellafield and Dounreay
- innovation at Magnox stations in progressing towards their entry into care and maintenance, however flask availability has affected progress in transporting spent fuel for reprocessing
- safe management of nuclear materials
- effective management of spent fuel
- new infrastructure for waste management
- environmental restoration through demolition of redundant buildings in order to return land for beneficial use
- new commercial opportunities created
- excellent performance from our two remaining generating stations

I hope you find this special edition of Insight interesting. As ever we value your feedback.

Tony Fountain, Chief Executive



Electricity target exceeded



During the year, electricity generation at Oldbury and Wylfa, two of the world's oldest operating nuclear power stations, has exceeded 8.14TWh – enough power for two million homes.

This is more than 3TWh above the target and has been achieved even with major planned outages for maintenance and repairs at three of the four reactors.

The achievement was made possible only by the continued safe generation at Oldbury which was originally scheduled to close in 2008, but will now continue generating into 2010.

Wylfa is also looking to continue generating electricity beyond its scheduled closure dates, subject to approvals.

Other activities included:

The last of more than **10,000 drums of Magnox Depleted Uranium (MDU) was transferred ahead of schedule** from Chapelcross site to the uranics management facility at Capenhurst, signifying the reduction of a major hazard.

The **Trawsfynydd Intermediate Level Waste Store is now open and receiving waste packages**. The £20 million slate-clad store, located in the Snowdonia National Park, is the first to be completed on a Magnox site.

The temporary weather barrier is now in place at Hunterston A, removing the serious hazard of glass panels falling from the two reactor buildings. Small areas were falling under

severe weather conditions such as high winds, allowing water penetration.

The capping roofs over Reactor one and Reactor two at Trawsfynydd are now complete, reinforcing protection of the reactor cores against the environment.

A 6km pipeline which discharges Chapelcross's cooling water to the sea is back in service after a major £2.2 million project to reline the interior for the decommissioning and defuelling phase.

Five out of 16 heat exchangers at Chapelcross are now free of asbestos as a major project, believed to be the largest asbestos strip in Europe, progresses.

Photograph: Oldbury power station



Flexible, cost-effective ILW management



Following more than two years of commercial and technical evaluation, the NDA has approved in principle Magnox's proposal to adopt a new Intermediate Level Waste (ILW) management strategy.

The innovative plan is based on the use of individually shielded cast-iron containers, known as MiniStores, which offer a flexible, cost-effective solution to ILW storage.

Other activities included:

New practices at the Dungeness A dissolution plant have improved efficiency and ensured delivery of the site's annual target to dissolve 7.5 tonnes of Fuel Element Debris (FED) ahead of schedule.

Issues with flask availability have had a negative impact on performance against Magnox targets for defuelling and delivery to Sellafield. Despite this, notable progress has been made in defuelling at Dungeness A and Sizewell A.

Bradwell has completed the construction of a purpose-built Low Level Waste (LLW) management facility, designed to improve the site's radiological waste processes.

NDA approval, alongside comprehensive discussions with regulators and stakeholders, has enabled the award of a five-year framework contract, worth up to £106 million, for the supply of containers.

Trial projects have been successfully completed at Dungeness and Bradwell, with a small number of containers filled. A retrieval and box filling campaign is expected to commence in 2011.

More than 1,700 skips at Hinkley Point A have been decontaminated eight months ahead of schedule, and are set for re-use in the nuclear industry.

Bradwell has successfully drained, processed and discharged 3,000 cubic metres of contaminated liquor from its cooling pond, despite challenging radiological conditions. The project has also seen a mobile team created, bringing together experts from across the company who will go on to share experiences and deploy innovative techniques on other ponds in the NDA estate.

Photograph: The first MiniStore being moved at Dungeness



Harwell buildings demolished

Four buildings were demolished at the Harwell site during the year. These included a former medical and health physics facility and building B393.6, a facility for post-irradiation and examination of fissile and non-fissile materials. Meanwhile, construction was completed of a new police and emergency services building as part of a project to release the Eastern portion of the site from NDA designation.

Other activity included:

A Very Low Level Waste (VLLW) route to dispose of concrete from the decommissioning of Winfrith's Active Handling Building, A59, was opened.

Just under 300 cubic metres of rubble was disposed of between December 2009 and February 2010.



New deal for fuel manufacturing plant



New commercial arrangements have been finalised between the NDA and Westinghouse Electric Company, involving the long-term lease of the Springfields nuclear fuel manufacturing site, near Preston in Lancashire.

The deal includes the permanent transfer of ownership to Westinghouse of Springfields Fuels Limited, which employs around 1,350 people onsite.

The new arrangements pave the way for significant investment by Westinghouse that will maintain high quality jobs and provide security for current and new employees.

Photograph: Aerial shot of Springfields



Reprocessing target exceeded



The reprocessing of spent fuel at Sellafield has exceeded targets by 17 tonnes, with full-year shearing, or cutting up, of 217 tonnes of oxide fuel achieved in the Thermal Oxide Reprocessing Plant (THORP) against a target of 200 tonnes.

Once sheared, both the oxide and metal fuels are dissolved in nitric acid.

The resulting 'dissolver liquor' is then chemically separated to produce three separate elements – uranium, plutonium and fission products.

THORP deals with oxide fuels from British Advanced Gas Cooled Reactors (AGR) and Light Water Reactors (LWR) from around the world.

Other activities included:

At the end of the financial year, **stocks of Highly Active Liquor (HAL) were at their lowest level for more than 20 years**. The liquor, a product of reprocessing spent fuel, will eventually be converted into a solid, more stable product through a process of vitrification. The stocks of 826 cubic metres are almost a third below the revised maximum level.

The first shipments of highly active waste (HAW) from Sellafield, via Barrow, have arrived safely in Japan and the Netherlands. The shipments mark the first consignments in the Vitrified Residues Return Programme which returns reprocessed solid HAW to its owners. The programme will return approximately 1,850 containers of vitrified waste over 10 years.

Operations in the vitrification plants, meanwhile, have also been very successful, exceeding targets for the year. The plants immobilised 4,634 tonnes of uranium equivalent, exceeding the target figure of 3,600 tonnes and producing fewer containers than anticipated.

Nine fuel assemblies were completed, ready to leave the Sellafield MOX Plant (SMP), against a target figure of eight. The MOX plant uses plutonium separated from used nuclear fuel during reprocessing and recycles it into new fuel. One tonne of plutonium, when recycled as MOX, can generate the same energy as well over two million tonnes of coal.

A major asbestos removal project was completed at Calder Hall when approximately 2,300 tonnes of cladding were removed from the 16 redundant heat exchangers.

Photograph: THORP at Sellafield



Storage capacity increases



The UK's Low Level Waste capacity was increased in July 2009 with the official handover of part of a new vault to allow interim storage of Low Level Waste containers. The last concrete pour for Vault 9 was completed in May 2010.

Over 90% of construction materials were delivered to the site by rail, significantly reducing the volume of road traffic through local villages. Vault 9 will provide storage capacity for an additional 5,500 waste containers, equivalent to approximately 10 years of incoming waste.

The waste is placed in engineered concrete vaults and, where possible, is compacted, containerised and grouted before emplacement.

The majority of waste disposed is transported by rail from Sellafield. Other waste arrives by road from facilities such as hospitals, research establishments and other industries.

Other activities included:

Work continues on the decontamination and clean-out of the empty Plutonium Contaminated Material (PCM) magazines.

Equipment used for assessing the PCM was completely removed, while preparations are well in hand to award the contract for final decommissioning of the facilities. The PCM, now removed, originally came from Sellafield and had been stored at LLWR for many years.

September 2009 witnessed the first shipment of contaminated metal for recycling at Studsvik's facility in Workington. LLWR continues to explore alternative treatment and disposal routes using the supply chain.

Photograph: Aerial shot of LLW Repository



World record for hazard destruction

A world record was set when Dounreay rid the NDA of one of its most hazardous legacies.

A purpose-built sodium destruction plant destroyed some 1,500 tonnes of liquid metal that had made up the coolant system of the Prototype Fast Reactor, exceeding by 50% the previous French record.

Attention is now focused on cleansing residues from the pipework and vessels as well as lifting out giant underground storage tanks still coated with metal.

Other activities included:

Dounreay has also exceeded the NDA's target for destruction of one of Britain's biggest environmental hazards.

The site has destroyed almost all of the 1,700 tonnes of liquid metal, sodium and potassium, left over from Britain's fast reactor programme. The site exceeded its revised target for destruction and delivered a stretch target when it hit the 100th batch to be lifted from the reactor and destroyed. Emissions from the £15 million destruction plant have been up to 4,000 times cleaner than its designers expected.



The single biggest hazard at Dounreay continues to shrink. More than 100 cubic metres of highly toxic liquor were pumped from underground tanks, neutralised and set in cement inside drums, making it safe for long-term storage or disposal.

The liquor is a legacy of the site's historic reprocessing of specialist nuclear fuel. All the work is done remotely in heavily shielded cells to protect workers and the environment from the radiation.

Dounreay became the first site in Scotland to be granted planning permission for a low-level radioactive waste disposal facility. Highland Council's decision was the culmination of several years work on options for the disposal for the large amount of lightly contaminated material arising from the site's demolition.

Main photograph: Clean-up team attacks giant sodium storage tank at PFR

Other photograph: Liquid metal destruction at DFR

Your feedback

We were pleased by the responses to past editions, and have aimed to take your views into account as the format evolves. Do continue to feed your views back to us.

Comments to the editor Deborah Ward on 01925 902343 or deborah.ward@nda.gov.uk

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