

# Sellafield

**Issue 06**

February 2017

## **In focus**

Thermal Oxide  
Reprocessing Plant

## **Reducing risks**

Waking our  
sleeping giants

# Sonic boom

3D mapping and gaming  
technology revolutionise clean-up

Transforming  
**Sellafield**



### **Removing an icon**

Decommissioning the Windscale  
Pile Chimney

### **Intellectual property**

Working differently with the  
supply chain

### **Calling all innovators**

Competition launched

# Want to be part of the **Sellafield** mission?

## **Click to find contracts**

If you want to do business with us and work on the Sellafield mission the best way to start is by registering on our tender management system. Once registered you will have access to all of our contracts over the value of £25,000. Our website is also full of information on how you can work with us as a subcontractor.

Your next contract could be just a click away – register today.

A hand in the foreground points towards a group of silhouetted people in a meeting room. The background is a bright, hazy scene with a grid pattern, suggesting a presentation or a collaborative work environment.

For notifications of up-coming contracts register on our Complete Tender Management System:  
<http://sharedsystems.eu-supply.com>

# Editor's Letter

The turn of the year means that now when we talk about completing our reprocessing mission in the Thermal Oxide Reprocessing Plant – or Thorp as it is better known – we talk about the plant stopping reprocessing next year. With our Magnox Reprocessing Plant set to follow suit in 2020, we are very close to the time when cleaning-up the iconic Sellafield site is the single focus of all of our resources.

Reducing the risks and hazards associated with our oldest nuclear facilities is not a new mission, indeed in the last twelve months we have moved sludge and fuel from our two legacy ponds into modern containment, and started to install the equipment that we need to empty our two legacy silos. This progress has been a long time in the planning. In this issue we look at how the challenges of emptying these buildings – the most hazardous in the UK – is creating a hive of innovation as our supply chain and academic partners help us to tackle problems for which there is no blueprint. Our cover story – the use of sonar technology to create detailed maps of one of our legacy ponds – leads the charge on page 12. The team in our second pond are proving that off-the-shelf technology is often the best solution to a complex problem, and you can read about their use of remote operated vehicles on page 25.

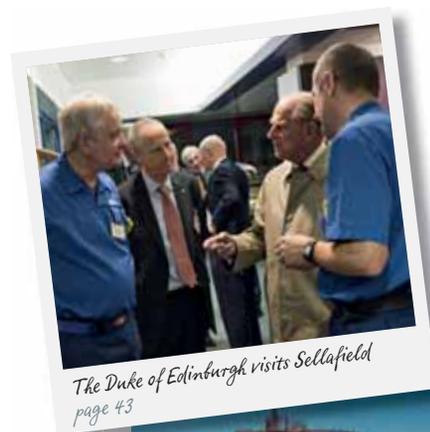
The closure of Thorp (read more about the plans for this on page 32) and the end of reprocessing is a major transition for the site, our workforce, supply chain and community. Preparing for our next chapter, augmenting our business so that we deliver maximum value for our customer, and becoming part of a vibrant and diverse local economy are at the very heart of our transformation programme. Read all about it on page 50.

Our skyline is also set to transform in the coming months as one of the last landmarks of our support to the atomic weapon, the Windscale Pile Chimney, comes down (page 20) and new facilities, like the interim storage facility, (page 44) go up.

Looking beyond our security fences, another change is the introduction of a crowd polling programme, putting the decision about where some of our community investment money is spent. Get involved and vote for your favourite community project at [www.decidingtogether.org](http://www.decidingtogether.org).

Elsewhere in this issue we celebrate the people who make all of this work possible (page 90) and meet our new retrievals director, John Oliver (page 80).

As always, if you have any feedback on *Sellafield Magazine*, we would love it hear it. Email [editor@sellafieldmagazine.com](mailto:editor@sellafieldmagazine.com).



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*How will we decommission a chimney damaged in the 1957 Windscale fire? page 20*



*Through the lens, Sellafield projects from design to operation page 56*



*We look at the transformation of our supplier, TSP Engineering page 77*

Keep up to date with our progress at Sellafield:

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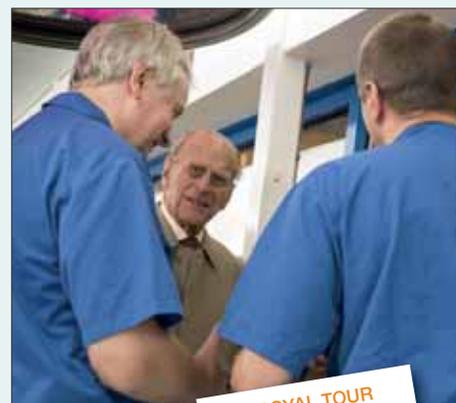


## On the cover

Our use of 3D mapping in our legacy ponds is being developed for use with virtual reality headsets so that our teams can have a really good look around.

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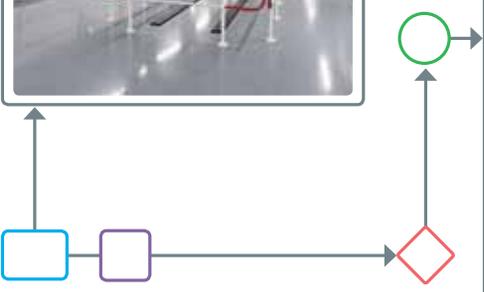


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**DELIGHTED WITH THE PROGRESS AT SELLAFIELD**  
 "There is a lot to do and that is both exciting and fulfilling."  
 – Mina Golshan



# 56 Our project teams are changing the Sellafield skyline



# Meet our contributors:

## Chris Darwin, head of transformation



Chris is no stranger to leading change at Sellafield having been at the helm of our transition from the ownership of Nuclear Management Partners to the Nuclear Decommissioning Authority in 2016. In this issue he sets out how transforming Sellafield will help us remove the site's hazard faster, invest our taxpayer funding more efficiently, and get agile enough to respond to future changes.

## Steve Barnes, public affairs manager

A regular contributor to *Sellafield Magazine*, Steve is passionate about the nuclear industry and the people within it. In this issue he talks to one of our non-executive directors, Nigel Smith about his career and the challenges that we face at Sellafield; and takes us inside the new National College for Nuclear. We watched in pride as Steve was presented with an Outstanding Contribution Award by the Nuclear Institute – for more, see page 101.



## Adam Sharp, mechanical design engineer



An apprenticeship gave mechanical design engineer Adam the skills he needed to become an engineer, from knowing how to produce engineering drawings and calculate stresses and strains within equipment to learning how to analyse engineering problems in a methodical and thorough way to ensure the best possible outcome. It also gave him life skills and experiences he will never forget, including being named as Advanced Level Apprentice of the Year at the recent National Apprentice Awards.

## Liz Morgan, civil and structural engineer

When Liz isn't assisting with ensuring some of our nuclear facilities are structurally sound, she is using her skills and experience as part of an international earthquake engineering field investigation team. They investigate the aftermath of disaster zones to see the real impact of a seismic event and to help earthquake prone countries improve the seismic resistance of their buildings. In this issue she recounts her recent trip to Italy.



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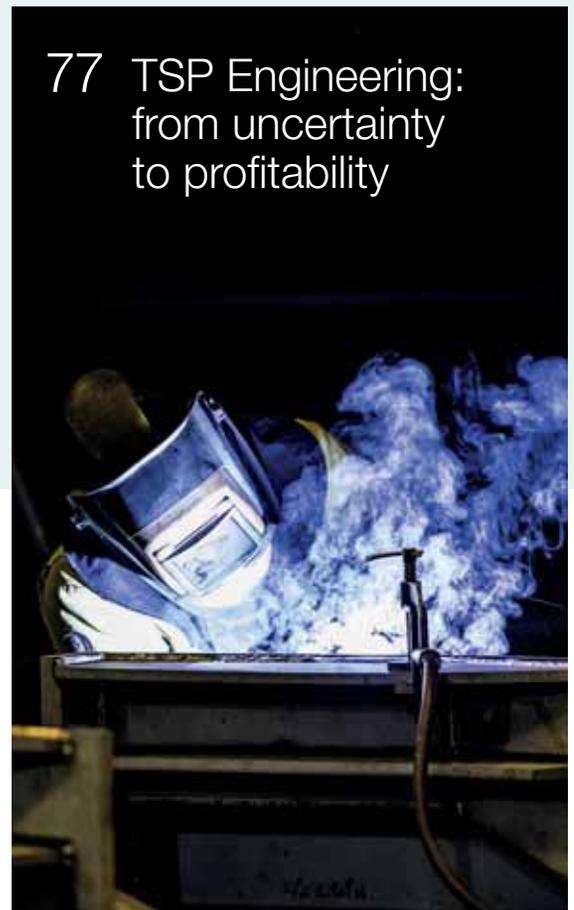
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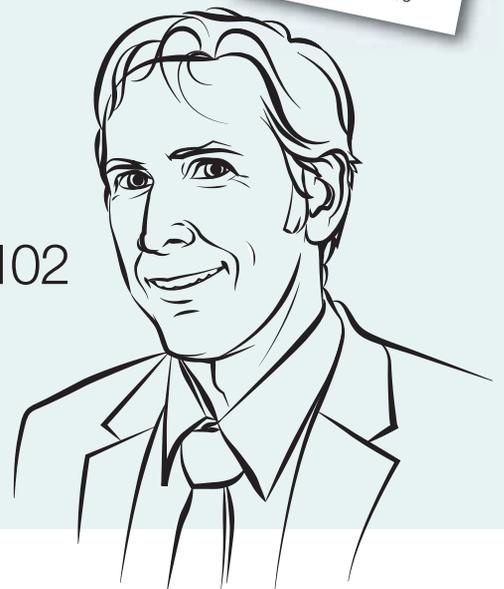
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Steve Barnes has been recognised with an outstanding contribution award from the nuclear institute

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**88** "My life – personal and professional – has changed over the last two years"

Jason Savage

## WHAT ARE...

# Value streams?

A new term has entered the Sellafield lexicon: value streams.

This is about how we will organise the work that we need to deliver for our customer, the Nuclear Decommissioning Authority, and how we will ensure that everyone across the business is focusing on adding value. It is also a useful reminder that while the materials we work with are unique and demand special care and attention, we are a business like any other. And putting value streams at the heart of the organisation is just good business.

**W**orking in value streams means defining what our customer values, and then prioritising what we do to put our effort and resources into doing only the right things. They remind us every day what we are here to do.

What we are here to do can be split into four value streams: retrievals, remediation, spent fuel management and special nuclear material. We will reduce the hazard and risk posed by our legacy ponds and silos through the **retrieval** of the sludge, fuels and waste that they contain as quickly as possible. We will also remove the nuclear liability of the rest of Sellafield through **remediation**, containing and removing the risks posed by our nuclear facilities safely and cost-effectively.

Our ability to deliver world class **spent fuel management** will continue as we complete our reprocessing mission and continue to provide safe and secure storage for used nuclear fuels. This work creates additional value for the wider nuclear estate, allowing them to complete their own nuclear energy production and decommissioning missions.

As experts in the use and storage of nuclear materials, such as uranium and plutonium, we will continue to manage **special nuclear material** to the appropriate standard.

Working to these value streams means that we can

prioritise what we do (and what we don't do), putting our effort and resources into doing the most important things. It's a very common approach in all types of business, and it's key to how we will transform our organisation.

As you can see from the diagram, each value stream is made up of a small number of sub value streams which in turn are made up of a number of product groups. For example, our retrievals value stream includes the First Generation Magnox Storage Pond which was used to cool, store and process fuel that had been used in Magnox

reactors (such as Calder Hall), so that it could then be reprocessed.

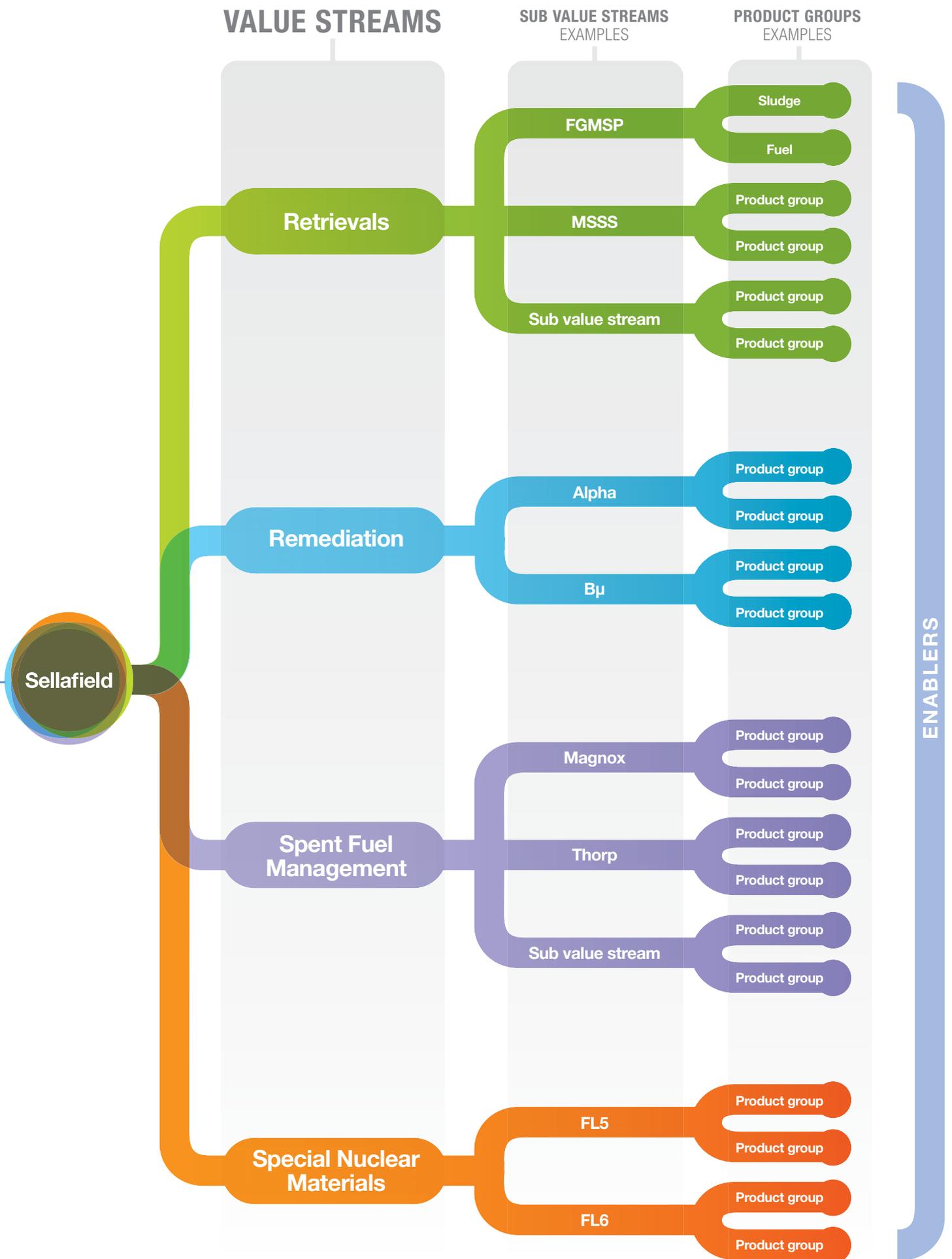
One of our tasks in that facility is the removal of radioactive sludge that has accumulated in

the bottom of the open-air pond, so sludge is classed as a product group.

Everything else we do is an 'enabler', such as our support facilities and functions, and is driven by what the value streams need in order to deliver their work.

Focusing on adding value and eliminating waste is good business and ensures that we are spending every pound of our tax-payer funded budget on work that will have the biggest impact on our mission.

**“Working to these value streams means that we can prioritise what we do (and what we don't do), putting our effort and resources into doing the most important things.”**



# Since October we have...

## EMPTIED...

two of the four reactors at Calder Hall. The used fuel will be reprocessed in our Magnox Reprocessing Plant.



## WELCOMED...

The Duke of Edinburgh, Prince Phillip, to Sellafield (for more, see page 43).



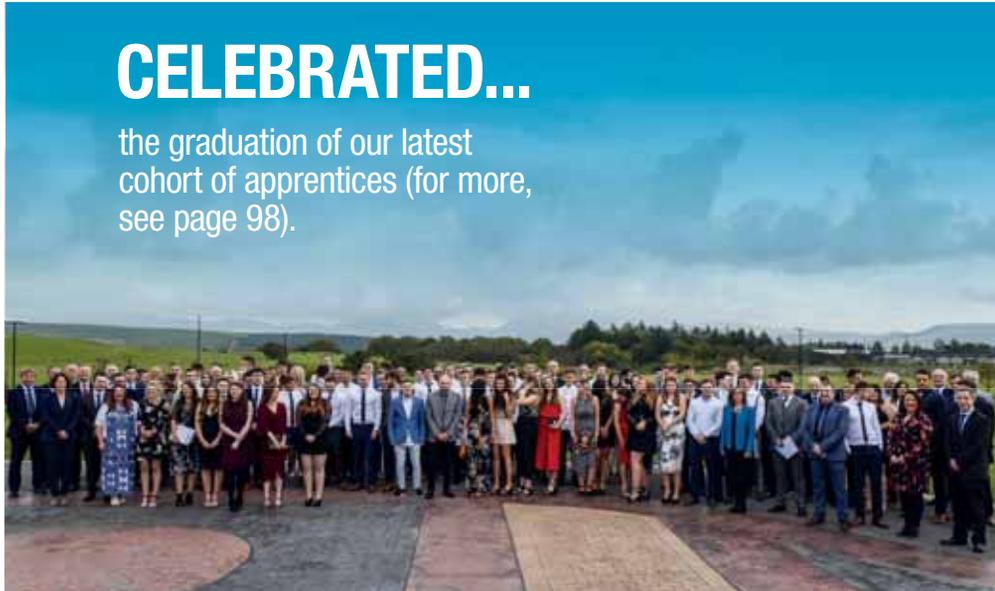
## HELPED...

young people get ready to apply for apprenticeships.



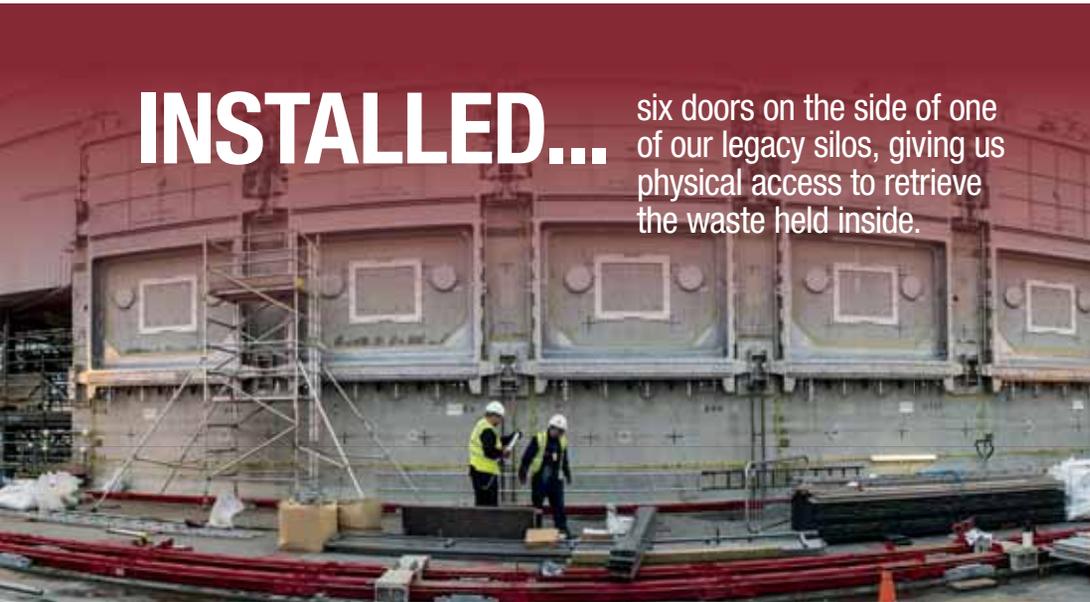
## CELEBRATED...

the graduation of our latest cohort of apprentices (for more, see page 98).



# INSTALLED...

six doors on the side of one of our legacy silos, giving us physical access to retrieve the waste held inside.



# RETURNED...

highly active waste to customers in Switzerland and Japan.

# STARTED...

to develop new project management apprenticeship standards for the Department for Business, Energy and Industrial Strategy as a way of growing the project delivery capability of the whole country.

# CUT...

the first piece of ground in the construction of a new national college for nuclear (for more, see page 72).



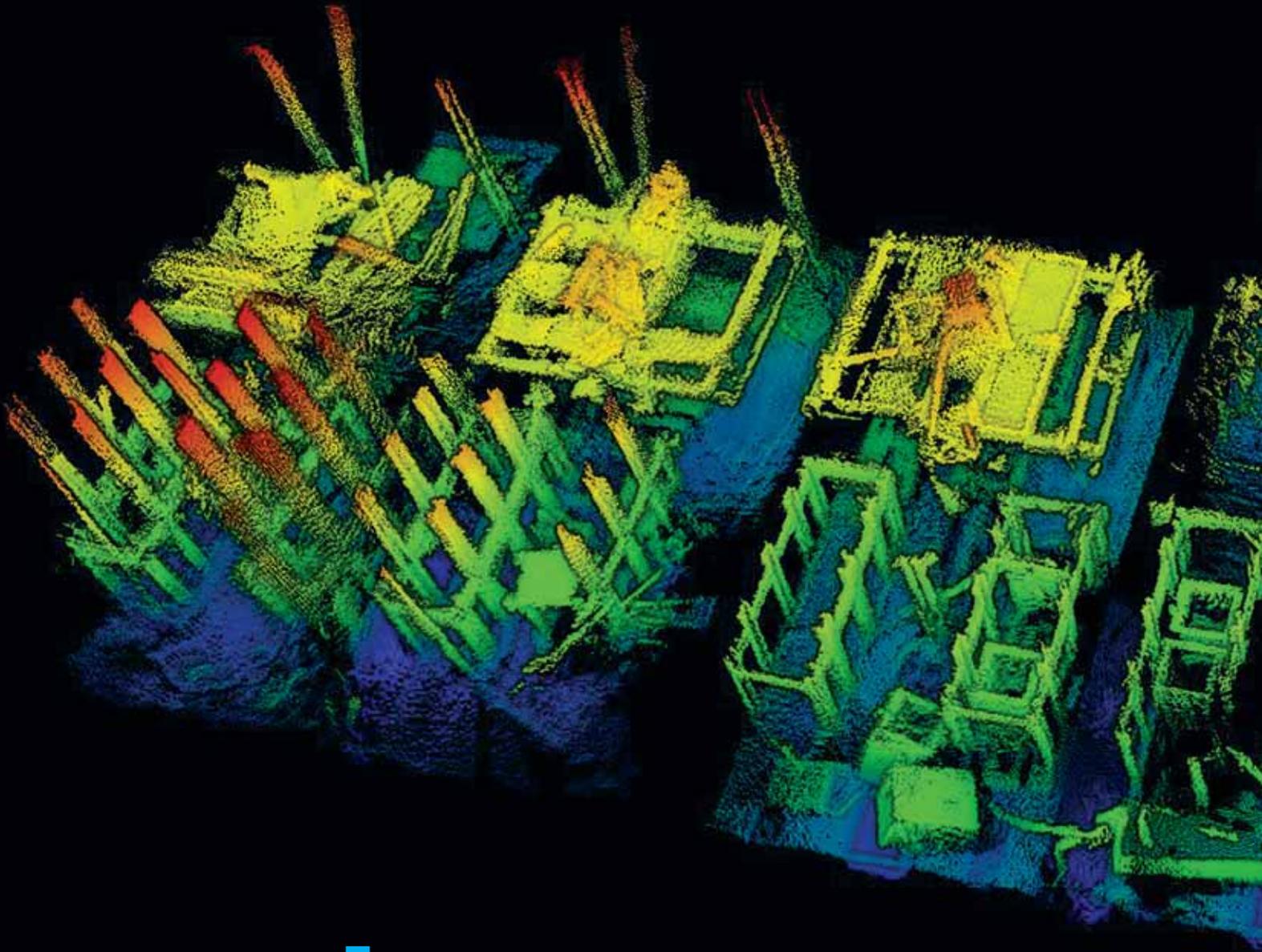
# RETRIEVED...

sludge from one of our legacy storage ponds for the first time.



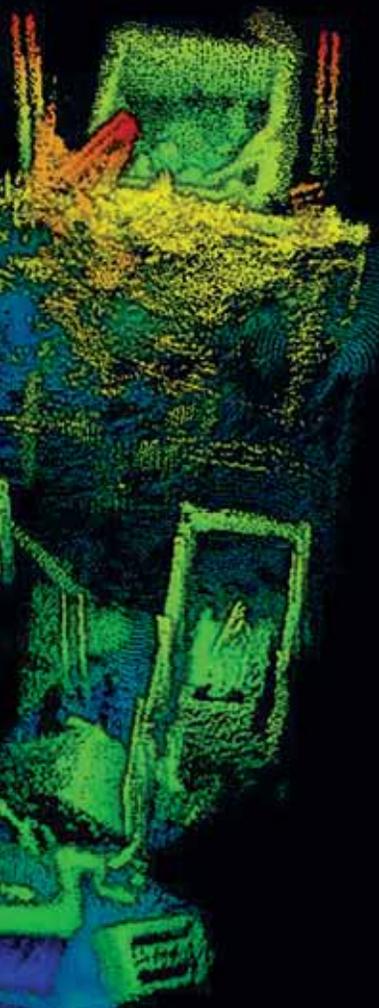
# APPOINTED...

a new waste retrievals director, John Oliver (see page 80).



**sonic**  
boom

We have been using sonar technology to help build a picture of inaccessible areas at Sellafield for years. Thanks to the seeds sown through a Nuclear Decommissioning Authority research and development grant, a Cumbrian small to medium sized enterprise is taking things to the next level both at Sellafield and abroad.



magazines which were suspended above the floor. The tangle of material meant the area became inaccessible by remotely operated vehicles, so the only way of seeing what was inside before Steve came along was by peering in from above with torches.

“It is literally like chasing shadows,” said Steve. “Each time the sonar picks up something solid it means there’s a blind spot or ‘shadow’ behind that point which we have to map from a different angle.

“There was so much material in there that it took more than three times the normal number of sonar scans to survey the area. Add in the challenge of working in an area where access is restricted by radiation levels and it was the hardest job we’ve ever done,” said Steve.

Considering other Fortis jobs could be looking for faults in an oil rig deep under the North Sea or scanning an icy cold underwater reservoir in North Wales, that’s some accolade.

The company has built up an international business from its rural base in Broughton, Cumbria. In 2007 Fortis successfully applied for a £32,000 research and development grant from the Nuclear Decommissioning Authority to use variable frequency sonar equipment to help characterise sludge in nuclear facilities. That grant allowed the company to build on the capability and intelligence offered by the more basic sonar equipment it had been using before.

The seed sown by the research and development grant has not only brought benefits to the UK nuclear industry, it is also helping abroad. Fortis is now working alongside Cocker-mouth-based Createc on mapping reactors 1 and 2 at Fukushima. It is currently carrying out feasibility studies and modelling work before conducting the actual surveys at the Japanese facility, hopefully later this year.

“Working with our technology partners Createc and Marine Electronics we’re taking sonar technology to new places for nuclear applications,” said Steve. “We are currently developing sonar mapping so that it will not only tell us that there’s something there, it will also tell us what it’s made of. Our next generation sonar probes will be able to ‘feel’ the environment so they can tell the difference between, for example, sludge or concrete or steel. For nuclear applications the sonar data will be overlaid with the gamma radiation value of the target area too.”

All in all it’s a clear case of sonar, so far.

Earning a nickname based on your profession is nothing new. Bob the Builder and Postman Pat were the natural culmination of centuries of people being named after their jobs. But somewhere in the past we lost the link between what you’re called and what you do, meaning there’s now plenty of Masons who can’t lay a brick and Bakers unable to make a loaf.

That’s why it’s refreshing to meet Sonar Steve, also known as Steve Lainson, Managing Director of Fortis Remote Technology. He’s one of the few people on the Sellafield site to have the distinction of being named after what he does. It is a nickname that has been earned over the years through his work in using sonar scans to map the contents of settling tanks and hazardous areas such as the withdrawal and decanner bays in the Pile Fuel Storage Pond.

Now Steve has taken his sonar skills to a whole new level – both here and abroad. He has just completed his most challenging job yet at Sellafield, mapping one of the most congested legacy areas of the First Generation Magnox Storage Pond: the magazine transfer bay.

It became cluttered over the facility’s operational years with blocked or faulty fuel



## Joystick generation aids nuclear clean-up

The information captured in the sonar mapping of the magazine transfer bay in the First Generation Magnox Storage Pond is being used in new ways, thanks to technology pioneered in the gaming world.

To fully explore the 3D map created by the sonar probes, those responsible for cleaning up the legacy pond will be putting on virtual reality headsets to have a really good look around.

The basic virtual reality equipment is now available off the shelf for about £1000 and our robotics and autonomous systems expert Dr Paul Mort says the nuclear industry is now enjoying the benefits of products created for the multi-billion pound gaming sector:

“Twenty years ago we looked at buying laser capture systems similar to the ones you now put on top of the console or television to play certain games. They cost around £25,000, now you can get far more powerful and sophisticated versions for your home for around £80.

“The mass market is having massive benefits for us. Most families have teenagers using joypads to interact with 3D games. This development has helped us ‘humanise’ information and processes which could be really dry and boring if presented in just words or diagrams. It helps us get more value out of our data,” said Dr Mort.

He says affordable, off-the-shelf gaming technology could also help the nuclear industry open its doors to more small to medium sized enterprises. “If we can use this technology to illustrate an area which needs to be cleaned up, then it could remove the need to walk around the facility to scope out a job. That means new people with new ideas could start to help us.

“More precise information and modelling on the nature of the challenge could also help remove a lot of the uncertainty, meaning we’d have more accurate and realistic estimations of what the work is likely to cost. This technology could potentially narrow down our cost predictions to the tune of billions of pounds and help drive out risk.”

 See more footage online – [www.sellafielddmagazine.com](http://www.sellafielddmagazine.com)

“More precise information and modelling on the nature of the challenge could also help remove a lot of the uncertainty about a job, meaning we’d have more accurate and realistic estimations of what the work is likely to cost.

This technology could potentially narrow down our cost predictions to the tune of billions of pounds and help drive out risk.”

**Paul Mort, Robotics and Autonomous Systems Lead**

## Listening skills

Using sound to help map our surroundings is nothing new – animals such as bats and dolphins have been using echolocation for millions of years.

It took humans a lot longer to unleash the potential of sonar. Leonardo da Vinci carried out the first recorded experiment in water acoustics in 1490, by lowering a tube into the ocean to listen out for passing ships. But it wasn’t until the turn of the 20th century that mankind began to unlock the potential of sound navigation and ranging, or sonar as it is better known. American naval scientists first used it sporadically from 1906 to detect icebergs – however it was the sinking of the Titanic in 1912 that brought the importance of sonar to the fore. The First World War and the race to detect the movement of submarines also drove technical innovation.

While the principle of working out what’s in the water by measuring the length of sonic echoes remains the same, today’s technology is a million miles from those first sonic pings 110 years ago. Now sonic probes fire millions of pulses which shape incredibly detailed 3D images in a ‘point cloud’. The mapping of the magazine transfer bay in the First Generation Magnox Storage Pond comprised around 24 million of these ‘points’.

Now that there’s a better understanding of exactly what’s in there, the team can plan far more effectively on how to empty and decommission the bay, building on the work carried out to bring the adjoining Magazine Maintenance Facility back into service in February 2016. The facility can now receive the blocked magazines from the bay so the team can work on dislodging the fuel bars and getting the waste out.

**SME FACTFILE:****FORTIS Remote Technology****Located:**

Broughton in Furness, South Cumbria with a workshop in Barrow.

**Founded:**

2006

**Number of employees:**

6

**Turnover:**

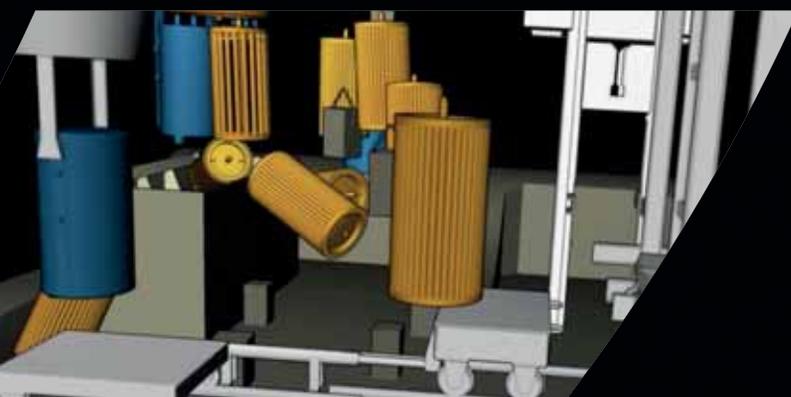
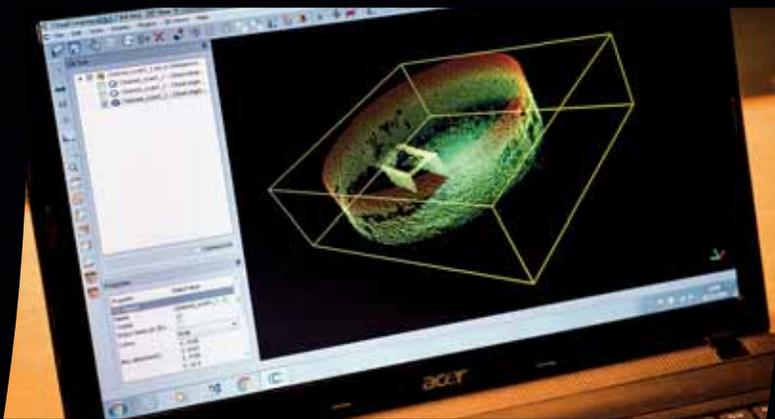
£1-2m

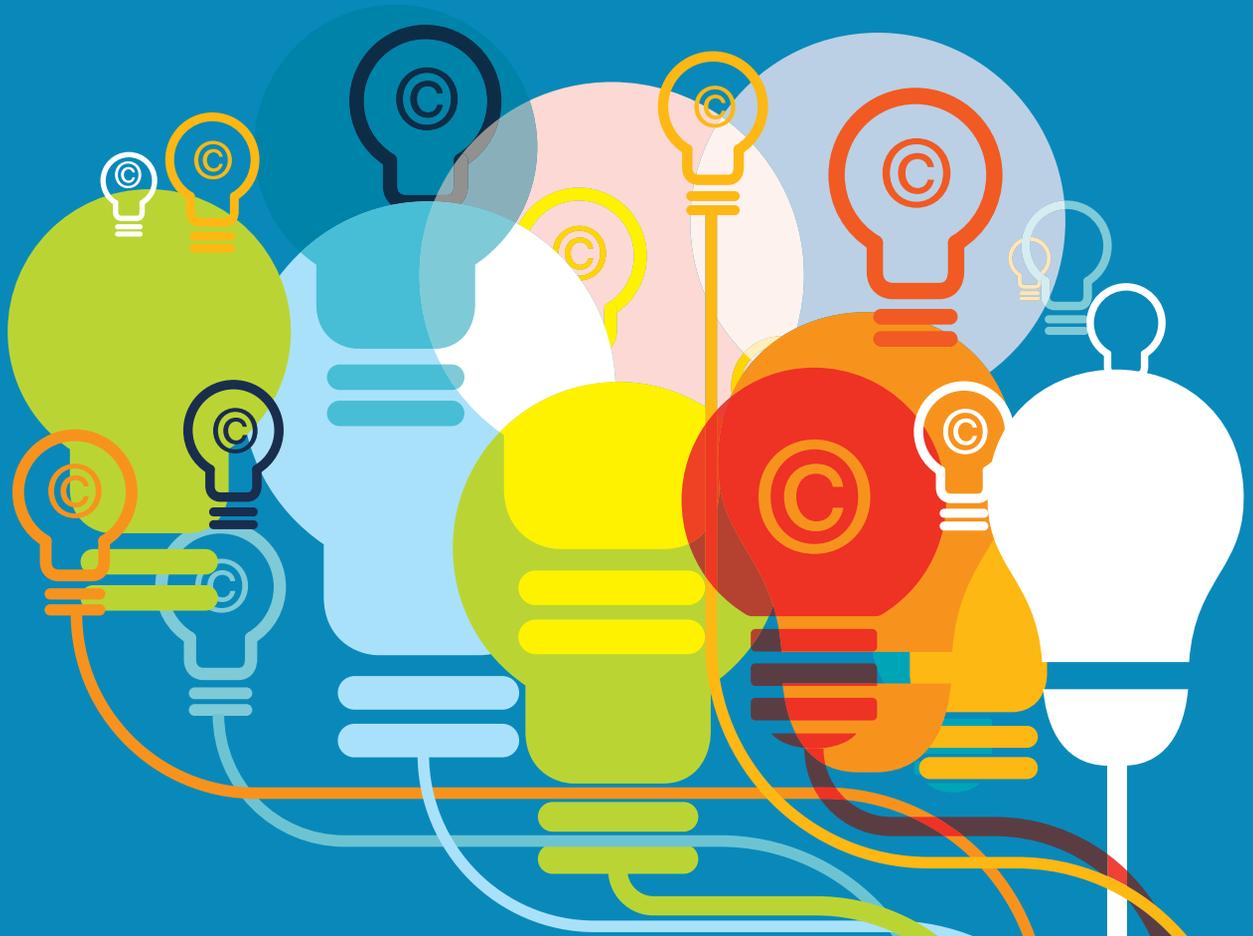
**Specialities and services:**

Fortis helps companies see places where humans can't go – particularly undersea for the oil and gas industry and in radioactive environments for the nuclear industry. It is a UK pioneer in the electro-mechanical aspects of remote technology, including design, specification and manufacturing. It also works with Cryopod Ltd in building cryotherapy pods for elite athletes, where stars such as Mo Farah, England Rugby and the New Zealand All Blacks improve their muscle recovery by cooling their bodies for two and a half minutes in temperatures as low as  $-130^{\circ}\text{C}$ .

**Website:**

[www.fortis-design.co.uk](http://www.fortis-design.co.uk)





# The right to grow

**With the announcement that intellectual property rights for the innovation and ideas that our supply chain are bringing to the Sellafield mission will stay with those companies, we look at what intellectual property rights are and how the change in how we work with the supply chain could lead to local business growth.**

In his address to local businesses gathered for the Britain's Energy Coast Business Cluster Awards in November, our supply chain director, Martin Chown, had some good news. He said: "I am delighted to be able to share a big change in the way that we will do business with our supply chain in future. From first thing on Friday morning (18 November), intellectual property rights for the innovation and ideas in our supply chain will stay with those companies. We will then work with them to exploit that innovation and intellectual property around the world."

Unsurprisingly, the announcement was well received by the business community. In a competitive market, owning intellectual property rights to your products or designs can attract investors, give you a competitive edge when bidding for work, confirms that you are offering your customers something new and different from the rest of the market, and gives you the ability to sell or licence your products or innovations providing an important revenue stream. They can even be used as security for loans.



### What are intellectual property rights?

Having an idea for something is not intellectual property. For example, an idea for a book doesn't count but a written book does. It is something unique that you have physically created therefore it needs to be protected to prevent others from copying or stealing it. Copyright, patents, designs and trademarks are all types of intellectual property protection but you need to apply to protect them.

Martin understands how important intellectual property rights are to businesses. He said: "Imagine spending weeks, months, or even years, developing your eureka moment only to see someone else either bring the idea to market first, or to copy it and become your competitor.

"It is good business sense to do all that you can to secure intellectual property rights for your products and innovations so that you can stop others using, making, selling or importing them without your permission and so that you can either earn royalties by licensing it or make money by selling it."



Imagine spending weeks, months, or even years, developing your eureka moment only to see someone else either bring the idea to market first, or to copy it and become your competitor. ”

### Intellectual property rights leads to growth

A small Cumbrian start-up, Createc, joined forces with Bedfordshire company, Blue Bear, to produce an innovative unmanned aerial vehicle that capture radiometric data in a way that couldn't previously be done.

Both companies offered something unique but by bringing their individual intellectual property together, they were able to offer a unique service to the nuclear industry. After a successful trial at Sellafield the riser has been used to locate hazardous radiation sources as part of the clean-up effort at Fukushima in Japan.

### Delivery at Sellafield

Reducing the risks and hazards associated with our nuclear facilities is creating a hot-bed of innovation with our supply chain partners developing tools and solutions. Martin said: "The change to allowing suppliers to keep their intellectual property rights applies to new technical innovations and designs. We still need access to background intellectual property to make use of the solutions that have already been developed for us under contract.

"In future, if we buy something that could be used at other sites in the Nuclear Decommissioning Authority's estate, we will want to buy on that basis, if it is for use at Sellafield only it will be bought on that basis. Working this way has benefits for all parties; we get to use the products and services with adequate rights to use them by way of a royalty free licence, and the supply chain keep their intellectual property rights, allowing them to further develop their innovation into the wider market which will hopefully result in more business opportunities and jobs." ■

UNSUNG HEROES

FLASK  
MAINTENANCE  
TEAM

Est. 1965

For protecting our vital  
nuclear transport assets and  
for helping to keep the  
UK's lights on.



Our unsung  
heroes

There are some plants at Sellafield that you hear a lot about, the big hitters that have the world watching. Then there are those who fly under the radar, quietly going about their business doing a great job... the unsung heroes of Sellafield. The maintenance of nuclear transport flasks might seem like a routine job, but it is critical for our clean-up mission and for helping EDF Energy to generate electricity and keep lights on across the UK.

The team in our flask maintenance facility carry out routine maintenance of our fleet of flasks that keep fuel routes open and support high hazard reduction activities at Sellafield and across the Nuclear Decommissioning Authority's fleet of nuclear sites.

Any activity that relies on the movement of fuel, waste or nuclear products to and around the Sellafield site relies on the team and the flask maintenance facility. The flasks act as the containment for the radioactive nuclear materials whilst in transit, so have to be maintained to the highest integrity, it is the flask maintenance team's job to facilitate this service.

They modify and repair the range of flasks that we use for different transports; decontaminate any flask that have carried nuclear materials so that they can be used again; and carry out non-destructive testing to make sure that the flasks are safe to use. They also have the skills to complete welding and machining repairs in-house.

The maintenance plant was built back in the 1960s and was commissioned in 1973. It was extended in 1986 so that the team could manage more flasks.

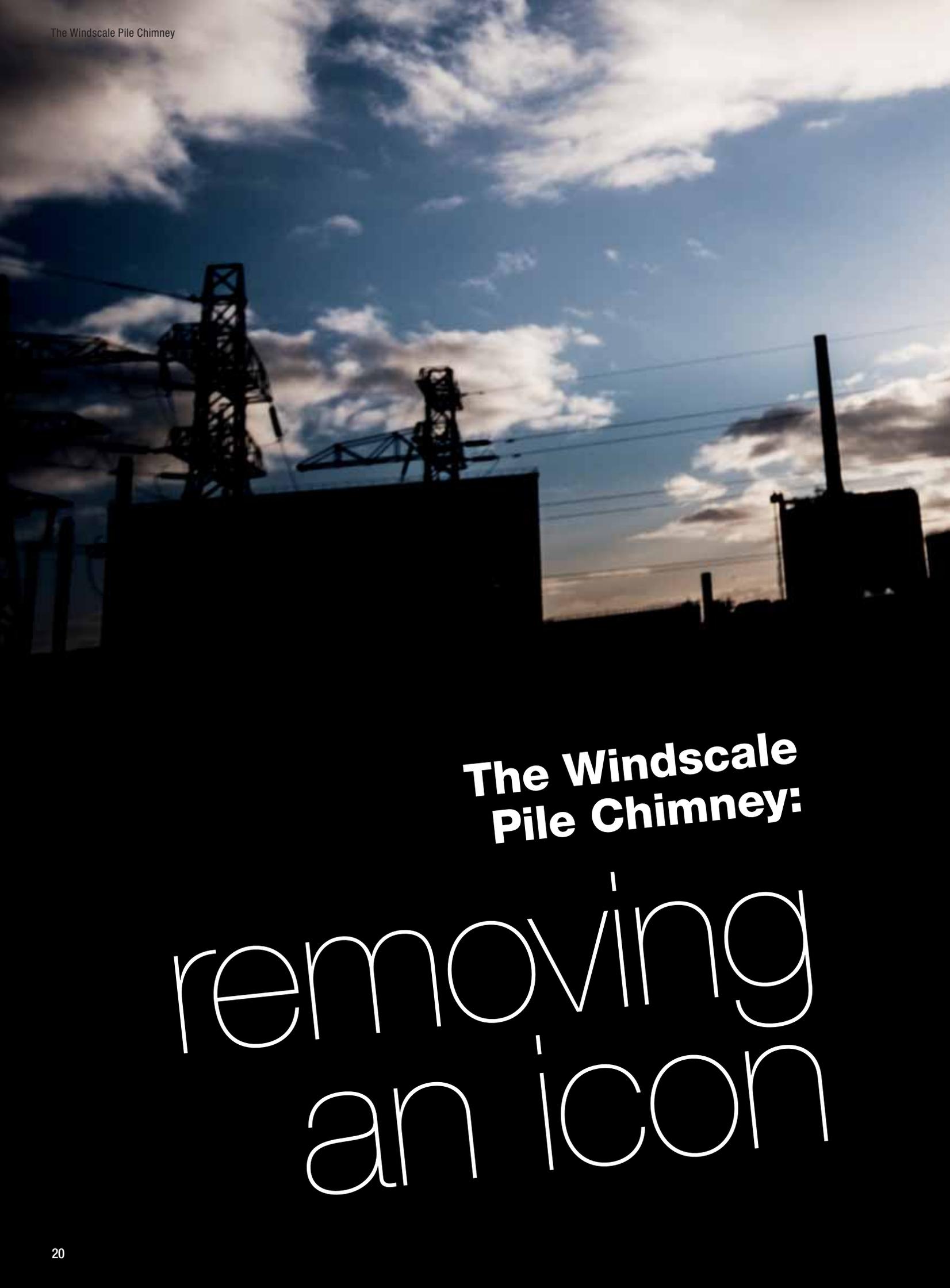
Shaun Allington, who works in the team, explains: "We are a multi-disciplined team covering process operatives, fitters, machinists, welders and painters.

"Without our facility our customers at Magnox and EDF Energy, who run the UK's nuclear power stations, would quickly lose their ability to meet their licensing conditions which would prevent fuel moves throughout the UK and negatively affect electricity generation.

"Essentially, we play an important part in keeping the UK's lights burning and support high hazard and risk reduction by allowing redundant nuclear power stations, such as Calder Hall, to keep their defuelling operations going as we maintain the flasks that they use." ■



WITHOUT OUR FACILITY  
OUR CUSTOMERS AT  
MAGNOX AND EDF  
ENERGY, WHO RUN THE  
UK'S NUCLEAR POWER  
STATIONS, WOULD  
QUICKLY LOSE THEIR  
ABILITY TO MEET THEIR  
LICENSING CONDITIONS

The background of the page is a photograph showing the silhouettes of industrial structures, including a large rectangular building and several tall chimneys, against a bright, cloudy sky. The scene is captured during the 'golden hour' of sunset or sunrise, with the sun low on the horizon, creating a dramatic, high-contrast image. The sky is filled with scattered white and grey clouds, and the overall color palette is dominated by the blues and oranges of the twilight sky.

**The Windscale  
Pile Chimney:**

removing  
an icon



**The Windscale Pile Chimney is one of the most visible reminders of the country's atomic mission. Standing 125m tall, the iconic chimney is unmissable when Sellafield is in sight.**

**N**ow, 60 years after the Windscale fire which ended its useful life, the chimney is set to be demolished – disappearing from view for the very last time.

Read on to find out about this remarkable part of the country's nuclear story, and how it will disappear.

The Windscale Pile Chimney towers over Sellafield in every sense of the word. It's the largest stack on the site, and dominates the skyline as Sellafield comes into view.

For many people, it is the building they picture when Sellafield comes to mind.

This is in no small part due to its significance to the country's nuclear mission, and its infamous history that followed.

In the aftermath of the Second World War people feared a third. Atomic weapons were seen as the best deterrent. Countries around the world raced to develop their own nuclear capability.

Following early collaboration with American scientists on the Manhattan Project, Britain was forced to develop its own capability following the US Congress signing of the McMahon Act, which prohibited the sharing of atomic secrets with other countries.

Sellafield was chosen as the location to produce the plutonium needed for the bomb, and a munitions factory became a nuclear site.

The British government authorised the construction of the two Windscale pile reactors in 1947, in 1950 the first reactor went critical and by 1952 the first billet of metallic plutonium was produced.

The two 125m tall ventilation chimneys were built during this period, and their iconic appearance was cemented by nuclear pioneer, and Windscale chief engineer, John Cockcroft, who insisted that filters be added to the chimneys. As construction was well under way at this point, they were installed to the top of the structures, giving the chimneys their unique shape.

Despite being known locally as 'Cockcroft's follies', they proved their value with the fire in Windscale reactor 1 in 1957. It was the filter at the top of the Windscale Chimney 1 that prevented this disaster from becoming a catastrophe, by limiting the amount of radiation released into the environment.

Following the fire, both reactors were closed, and the chimneys were no longer needed. The second chimney was demolished in 2001, however the contamination from the fire made the challenge of removing chimney 1 much more significant.

# The implications of the Windscale fire

The 1957 fire was a wake-up call for the nuclear industry. It led to vast operational and technological improvements in nuclear reactor design, technology, licensing and regulation, which have stood the test of time.

The Office for Nuclear Regulation is the country's nuclear regulator and its predecessor organisations were founded in the aftermath of the fire – recognising that regulation needed to be more robust. In the early days, the pace of developments outstripped that of regulation.

Over the years since the fire, the nuclear industry's relationship with its regulators

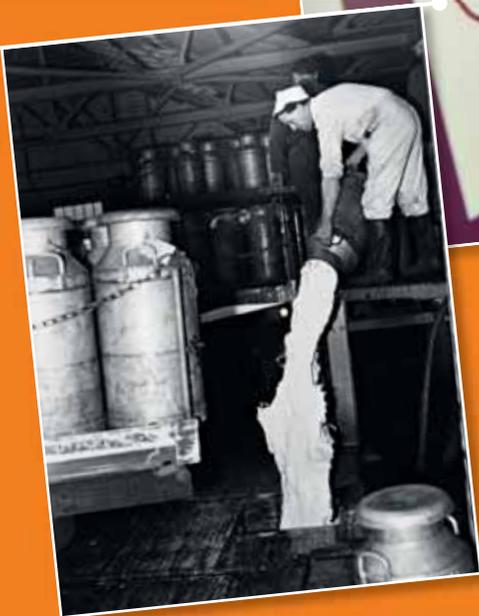
has developed, and is now represented by the G6. Formed in spring 2014, it is made up of representatives from Sellafield Ltd, ONR, the Environment Agency, the Nuclear Decommissioning Authority, the Department of Energy and Climate Change and UK Government Investments.

The aim of the group is to work together to safely and securely accelerate hazard and risk reduction at Sellafield.

This pragmatic approach has helped the pile chimney project progress.

Right: We are working with our owner, our regulators and the government to accelerate risk and hazard reduction

Below: The disposal of local milk in the aftermath of the fire



# How do you solve a problem like Pile Chimney 1?

Once one of a pair, Windscale Pile Chimney 1 now exists as a reminder of Sellafield's history. It's a 125m tall, 14m in diameter concrete structure, which stands solidly in the heart of the Sellafield site.

Given we're this year remembering the sixtieth anniversary of the fire that closed the reactor it supported, the chimney's useful life has long since departed. The condition of the stack – which no longer meets modern structural standards – means that its demolition is now a priority. The passage of time, along with more advanced assessment and decommissioning techniques, enables this.

The first decommissioning work started in the 1980s with the removal of some of the brick and ancillary facilities. Decommissioning work recommenced in 2014 with the opening up of the structure. This was followed by the removal of the now-legendary filter galleries from the top of the stack.

Since that point, work has been focused on progressing procurement and preparing the stack for the demolition of the diffuser, which is located below the former filter galleries.

The team were keen for the project to proceed in the most cost-effective, fit for purpose, way. Learning from the demolition of the first chimney coupled with a 'think differently' philosophy, looking outside the nuclear industry, led to the development of a straightforward, three step approach.

- 1. Cut the structure into large blocks**
- 2. Use the tower crane to lift and move the large block sections**
- 3. Use available licensed landfill facilities to avoid the need for unnecessary decontamination**

In progressing this option, the project had to overcome resistance – namely that we don't use tower cranes at Sellafield, we hadn't demolished a facility in this way before, and would need a different type of safety case.

Contracts were signed for this work in late 2016. The next stage will be preparing for the arrival and installation of the tower crane in autumn 2017.

Demolition of the diffuser will start in November, and should take a little under two years to complete.

Following this, the plan is to complete the remainder of the demolition to the pile cap, 35m line by April 2021.

Chris Wilson, the senior project manager, explains: "We have been working tirelessly for three years with AECOM of the Design Services Alliance and industrial demolition experts on this project in order to develop a robust design and methodology for demolition that can now be put into practice. During this time we've been working closely with our regulators and stakeholders, to ensure they're confident in the approach we are taking.

"We've been able to take learning from the project to demolish chimney 2 in 2001, and where possible, will be applying this to chimney 1. Our approach has been to adopt and apply proven demolition techniques and processes used outside of the nuclear industry, avoiding the need for bespoke design and creating a fit for purpose approach to this significant demolition project."

## A collaborative approach

Like many of our major projects, the Windscale Pile Chimney decommissioning project is a joint effort, involving a number of partners.

- **A core team of around 25 Sellafield Ltd employees have been working on the project.**
- **Another thirty employees are provided through the Decommissioning Delivery Partnership (DDP) consortium ADAPT, which is made up of Areva, Doosan and Atkins. ADAPT are bringing specialist skills and experience from across a wide range of sectors. The team will be integrated with the Sellafield team to ensure progress.**
- **Kaefer are providing specialist engineering services and demolition access.**
- **The Design Services Alliance is providing engineering inspection and validation services. The alliance has been integral to getting the project to the stage it's now at.**
- **The project is supported by specialist teams from across our organisation. They provide specialist skills, undertake the intelligent customer role, and provide an appropriate level of scrutiny to the project, to ensure it is delivered safely.**



# Smarter waste management

**D**emolishing a chimney the size of the Windscale Pile Chimney will create a large amount of waste – 5,000 tonnes in fact, and with varying degrees of radiological contamination.

Sensible, cost-effective waste management is an important part of the future of Sellafield, as we clean up the site – removing facilities that have completed their mission.

This means knowing what waste we'll create, what the classification of this is, and how we will dispose of it.

By doing that we can identify the most suitable waste disposal routes, get a better understanding of the cost and negotiate the appropriate disposal contracts.

This project has identified and understood its waste disposal needs prior to demolition, and the best routes have been identified, minimising unnecessary cost.

**“ADAPT is delighted to be undertaking this work. It means that our joint venture companies, AREVA, Doosan Babcock and Atkins can pool our significant global expertise to work with Sellafield Ltd on this iconic project, which will deliver both a decommissioning priority and a visible legacy of skyline change.**

**“Decommissioning the chimney is an important piece of work and one where we're committed to thinking differently to deliver a cost-effective, fit for purpose solution that uses the most appropriate demolition techniques making use of local SMEs wherever possible.”**

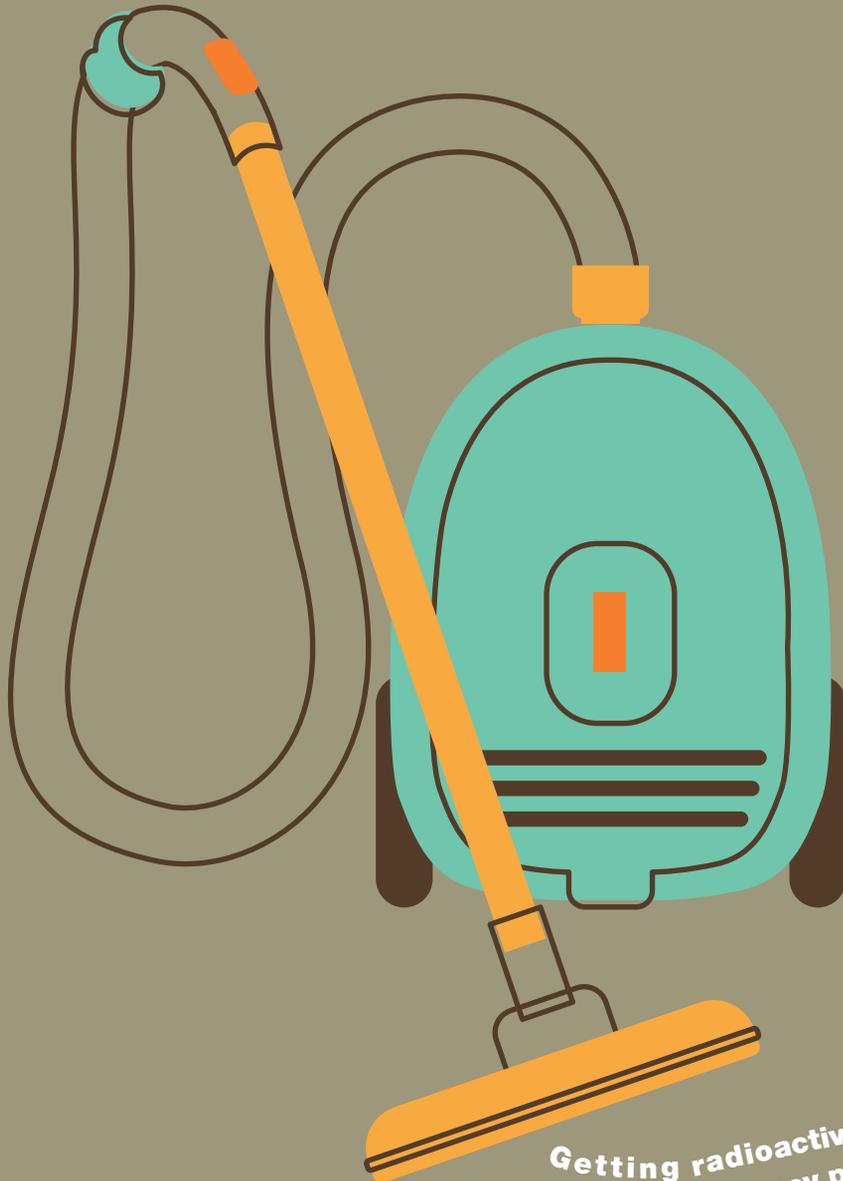
Paul Terry, ADAPT Framework Manager



See the removal of the Windscale Pile Chimney's filter gallery – [www.sellafielddmagazine.com](http://www.sellafielddmagazine.com)

# Suck it and see

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**Getting radioactive  
sludge out of the legacy ponds  
is the mother of all spring cleans.  
And, just like a household vacuum cleaner,  
there's a variety of different 'heads' to attach  
to the machinery needed for sludge retrievals. All  
of them do different jobs... and they're so ingenious, we  
think Sir James Dyson would be proud.**

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**You may not have seen it in all of the ‘Reviews of the Year’ for 2016 (small matters such as Brexit, the Olympics and Donald Trump hogged the column inches) but for us 2016 was the year of sludge. We started firing on all cylinders in the task of removing this material – a mixture of corroded fuel, broken-down organic matter and waste particles – from the two legacy ponds.**

In the First Generation Magnox Storage Pond, we started bulk sludge retrievals for the first time in March – marking the start of about six years of systematically removing 1,500m<sup>3</sup> of silty radioactive waste (the equivalent volume of around 15 double decker buses).

At the end of the calendar year a fortnight before Christmas, the first ever exports of sludge took place from the Pile Fuel Storage Pond. The volumes and radiation levels of the material in this older pond are less challenging, but it’s still a mammoth undertaking that will take until 2022, according to current programme estimates.

Now that we’ve started the process of emptying both legacy ponds, it’s time to pay tribute to some of the different bits of kit which are making these facilities less hazardous day by day by getting the sludge into a safer place. The Pile Fuel Storage Pond has a different set of tools as the sludge there is thicker, so here we’re focusing on equipment in the First Generation Magnox Storage Pond.

Operating in a radioactive environment, they all have to be ultra-reliable, require minimum maintenance and get on with the job at hand.

## BULK SLUDGE REMOVAL TOOL

### How it works:

We place a 1m x 1.3m square metal ‘hood’ (a bit like a giant upturned biscuit tin) on top of an area of pond floor covered in sludge. The hood is 30cm deep. Two pumps then agitate the sludge within the hood by sucking in water and squirting it out to create a slurry. The main discharge pump in the middle of the hood sucks up the slurry and transfers it over to storage tanks in another plant to settle out. It takes 15-20 minutes to clear each area and then the hood is picked up by a crane above and placed on the next area to do the same again – this is called a ‘hop’. A normal transfer of 4-5 hops sends the equivalent of around 1,000 household baths (80m<sup>3</sup>) of contaminated water over to the storage tanks – although it only yields about 10 baths (800 litres) of actual sludge once settled.

### Background:

Manufactured by James Fisher Nuclear Ltd, we started trials in 2013. Learning from these trials led to modifications to reduce blockages and improve pump seals. TIS in Workington, which is now building a second tool, helped with the modifications too. The tool was first installed in the First Generation Magnox Storage Pond in April 2016 and was first used to transfer real sludge on 11 November 2016.





## CREVICE SLUDGE REMOVAL TOOL

### How it works:

This gets into the parts the bulk sludge removal tool can't reach with its 1m long hose able to hang down into crevices between skips – just like when we take the main attachment off the vacuum to run the hose under the skirting boards. It is 'driven' by a crane above and is raised and lowered each time to suck up a small area of sludge below in a movement called a 'stitch'. It stitches its way along a skip so the sludge can be removed before it is lifted clear.

### Background:

Manufactured by James Fisher Nuclear Ltd, we started trials in 2013. It has built-in cameras at the top of the hose so the driver can accurately line up the tool with the gap between skips. It is due to start being used to transfer sludge from the First Generation Magnox Storage Pond in March 2017.



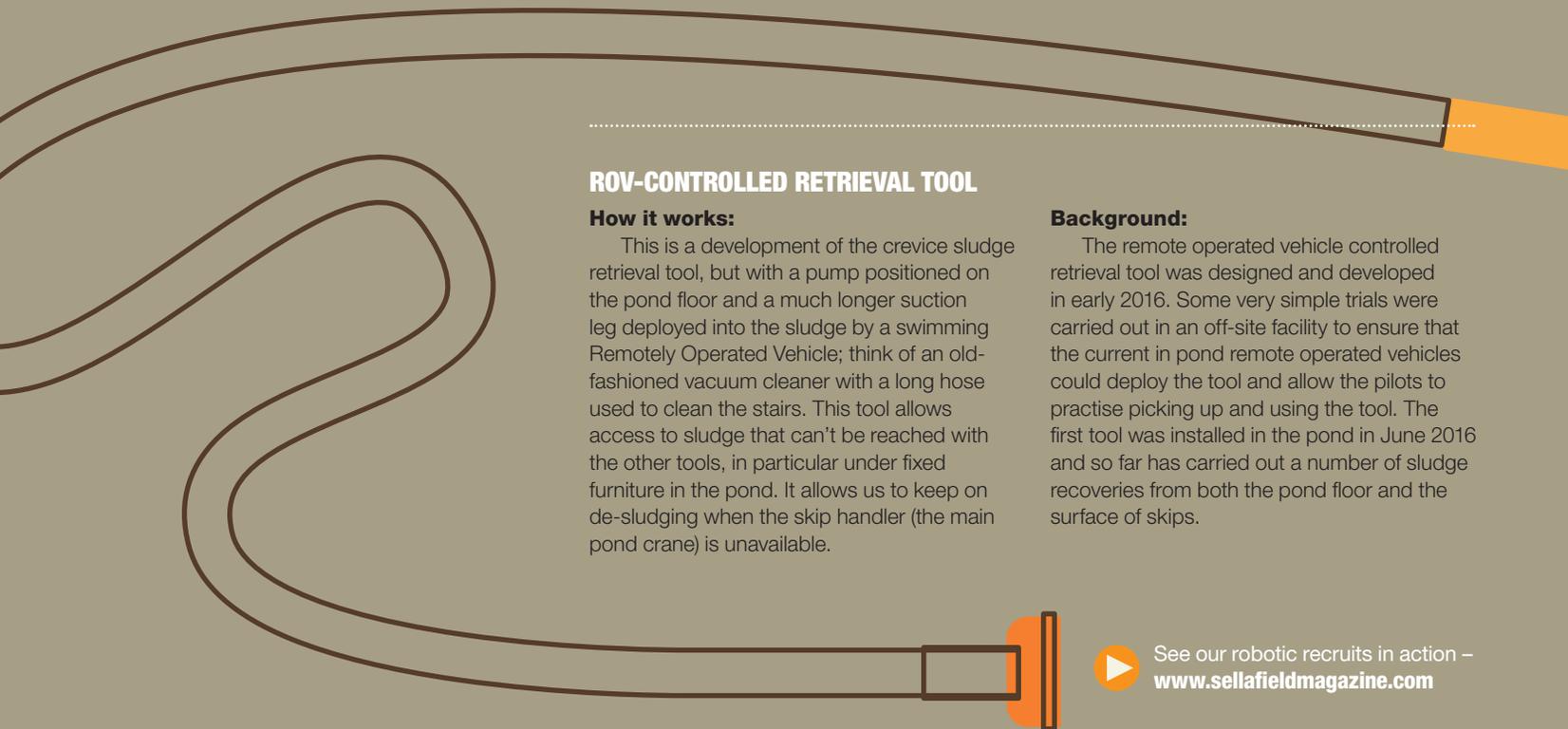
## DELUGE SKIP WASH BOX

### How it works:

It's a bit like an underwater dishwasher which sits on the floor of the pond – except it's about the size of a Transit van. Skips of fuel are picked up by the overhead crane and carefully lowered inside. The wash box is then closed underwater by the crane placing its lid on top. Six powerful jets of pond water, each with the equivalent force of a fireman's hose, are then shot into the skip to agitate the sludge, while a discharge pump draws off the sludgy water inside it. Each sludge transfer delivers the equivalent of around 500 household baths (40m<sup>3</sup>) of contaminated water to the settling tanks – although it only yields about 3 baths (250 litres) of actual sludge. Just like a dishwasher running without pots and pans, it has a self-clean cycle to remove accumulated debris inside.

### Background:

We started working with National Nuclear Laboratories in the early 2000s to develop this tool, with the detailed design carried out by North West Projects. Manufactured by Darchem in Stockton on Tees, test trials started in 2013 and it was first used in the First Generation Magnox Storage Pond in March 2016. One of its first sludge transfers not only revealed previously unseen fuel bars in a skip, it also washed animal bones out of the skip – most likely from a seagull.



## ROV-CONTROLLED RETRIEVAL TOOL

### How it works:

This is a development of the crevice sludge retrieval tool, but with a pump positioned on the pond floor and a much longer suction leg deployed into the sludge by a swimming Remotely Operated Vehicle; think of an old-fashioned vacuum cleaner with a long hose used to clean the stairs. This tool allows access to sludge that can't be reached with the other tools, in particular under fixed furniture in the pond. It allows us to keep on de-sludging when the skip handler (the main pond crane) is unavailable.

### Background:

The remote operated vehicle controlled retrieval tool was designed and developed in early 2016. Some very simple trials were carried out in an off-site facility to ensure that the current in pond remote operated vehicles could deploy the tool and allow the pilots to practise picking up and using the tool. The first tool was installed in the pond in June 2016 and so far has carried out a number of sludge recoveries from both the pond floor and the surface of skips.



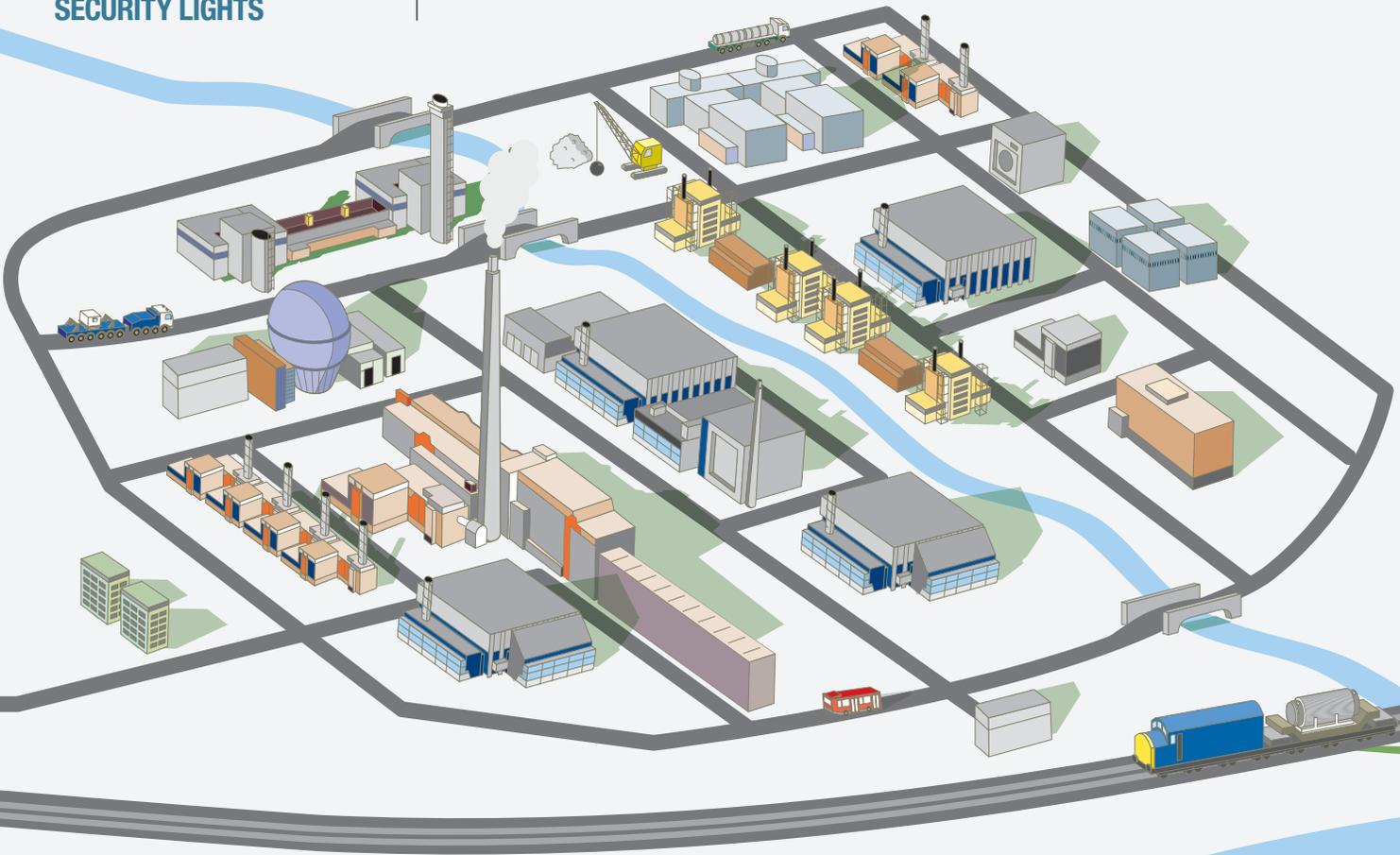
See our robotic recruits in action – [www.sellafieldmagazine.com](http://www.sellafieldmagazine.com)

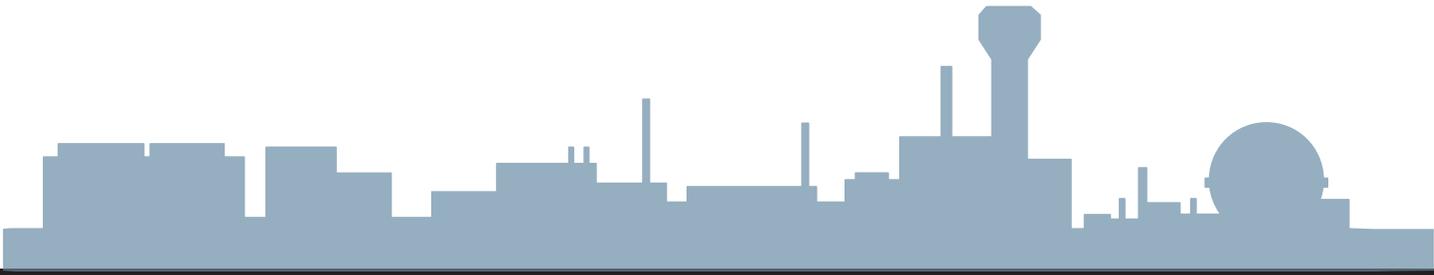
# 10 FACTS ABOUT KEEPING SELLAFIELD MOVING

**1** **30** miles  
THE SELLAFIELD SITE HAS 30 MILES OF ROAD NETWORK, WITH ALMOST 70 BRIDGES, 200 HIGHWAY CROSSINGS AND 1,800 STREET OR SECURITY LIGHTS

**2** **5,000**  
There is parking space for around 5,000 vehicles on or near to the site, though this number will reduce as we use this space for additional plants and facilities required to deliver our mission.

**3** **8,500**  
During the working week, on average 4,200 vehicles head to the Sellafield site (and adjacent, off site car parks) between 05:30 and 08:30. During a 24 hour period, this rises to a total of up to 8,500.





**4** We have introduced a new service to allow our employees to offer lifts and search for potential people to share their lift to work with. We've done this with the aim of reducing the number of vehicles on the road and number of unnecessary journeys.



**5** Our commercial deliveries are managed via a dedicated delivery management system, which directs vehicles to the most appropriate location at the most appropriate time. This avoids queues outside our buildings or the site.

**6** The River Calder bisects the Sellafield site. The route of the river was straightened out in the mid 1970s, so that the site could accommodate further nuclear facilities including our Fuel Handling Plant.

**7** **SELLAFIELD HAS ITS OWN STATION ON THE CUMBRIAN COASTAL RAILWAY LINE, ADJACENT TO THE SITE. THE LINE IS ALSO USED FOR FREIGHT DELIVERIES TO THE SITE, WITH A SECURE ACCESS POINT. THE SITE ALSO HAS ITS OWN INTERNAL RAILWAY NETWORK, USED TO TRANSPORT MATERIALS BETWEEN FACILITIES.**



**8** Our delivery partner, Peterson, manage the commercial delivery process. They receive goods at our Lillyhall security and distribution centre, for security screening and consolidated onward delivery.



This strengthens security and the number of commercial vehicles that need to visit the Sellafield site.

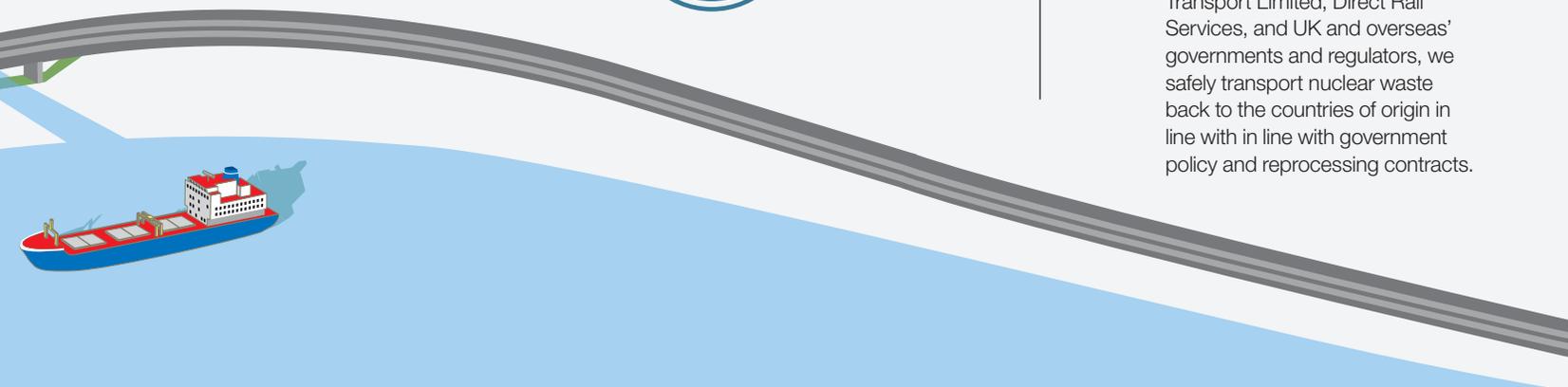
**9**



**THERE ARE APPROXIMATELY 3,000 RAILWAY TRANSPORT MOVEMENTS BETWEEN FACILITIES ON THE SITE EACH YEAR, AND 1,000 THAT EITHER LEAVE OR ARRIVE AT THE SITE**



**10** Working in partnership with the Nuclear Decommissioning Authority, International Nuclear Services, Pacific Nuclear Transport Limited, Direct Rail Services, and UK and overseas' governments and regulators, we safely transport nuclear waste back to the countries of origin in line with in line with government policy and reprocessing contracts.



# International learning

Natural disasters such as tsunamis and earthquakes are a reminder that however unlikely the event, preparation is key. Following the devastating earthquake in central Italy in August last year, one of our civil and structural engineering experts, **Liz Morgan**, flew to the region to see how traditional and engineered structures can be improved to resist seismic damage





**“THE DEVASTATION THAT THE EARTHQUAKE LEFT WAS SHOCKING. WE SAW EXTENSIVE BUILDING DAMAGE. THESE WEREN’T JUST BUILDINGS, THEY WERE PEOPLE’S HOMES, BUSINESSES AND SCHOOLS. YOU CAN’T APPRECIATE THE EMOTIONAL IMPACT OF AN EARTHQUAKE FROM A PHOTOGRAPH.”**

**A**s a civil and structural engineer at Sellafield, Liz Morgan is aware of the potential damage that an earthquake can cause to structures. Even though the likelihood of such an event at Sellafield is incredibly low, we are never complacent.

Liz explains: “Many of our buildings at Sellafield were built sixty or seventy years ago; well before extreme seismic design criteria were considered to be necessary.

“Although it is very unlikely that Cumbria would experience an extreme earthquake, we take a best practice approach to assessing the potential impact of such an event on our nuclear buildings. This approach means that we can identify and implement improvements that increase the resilience of our older buildings.”

Seeing the effects of an earthquake first hand as part of an international Earthquake Engineering Field Investigation Team not

only helps to improve Liz’s understanding of the real impact of seismic events and their aftermath, but she and the team are able to help earthquake prone countries to develop ways to improve the seismic resistance of both traditional and engineered structures.

We have supported the Engineering Field Investigation Team since 1989 and our experts have taken part in six field missions.

She explains: “The team is made up of engineers like me, earthquake engineers and academics. We typically visit affected regions two or three weeks after the earthquake to avoid disrupting emergency relief operations.

“We visited Italy in October last year to carry out field investigations looking at the structural damage of masonry and reinforced concrete buildings and bridges in the towns and report our findings to the engineering community.

“The devastation that the earthquake left was shocking. We saw extensive building damage. These weren’t just buildings, they were people’s homes, businesses and schools. You can’t appreciate the emotional impact of an earthquake from a photograph. Seeing the damage first hand means that we can contribute to an improving understanding of structural behaviour under seismic loads and help to drive improvements that mean, should the unthinkable happen again, there is less damage.”

Back at Sellafield Liz is sharing her experience and findings with the teams responsible for building new facilities on the site. ■

## IN FOCUS:

# The Thermal Oxide Reprocessing Plant

## PREPARING FOR THE FUTURE

It has generated billions of pounds for the UK economy by recycling nuclear fuel that generated low carbon electricity and kept lights across the world burning bright. The Thermal Oxide Reprocessing Plant – or Thorp, as it is better known – is set for some big changes in the next couple of years. Our teams in the plant are working hard to ensure that their mission is finished safely and with pride whilst also planning for transitioning their own careers and planning for life beyond reprocessing.





**Top:** Thorp was one of the biggest construction projects of its time.  
**Bottom:** The plant is preparing for a new role in the receipt and storage of used nuclear fuel.

## The different areas of Thorp

**Receipt and storage** – here the fuel arrives in a transport flask, it is removed and placed into the storage pond to allow the fuel to cool and the radioactivity to decay.

**Head end** – The fuel is sheared and dissolved in hot nitric acid, the fuel inside the metal casings dissolves and the liquid is transferred to the chemical separation plant.

**Chemical separation** – using a solvent then goes through a chemical separation process to separate out the uranium, plutonium and fission products (waste).

**Finishing lines** – The uranium and plutonium are processed here and dried into powder which is placed into containers and safely and securely stored. Thousands of tonnes of recovered uranium has already been export on behalf of customer to be remade back into new fuel-completing part of the fuel cycle and enabling continued low carbon electricity generation. Further thousands of tonnes remain to be exported.

## THORP – HOW IT BEGAN

Our ability to reprocess used nuclear fuel is as old as the Sellafield site. It is how we extracted plutonium for the atomic weapons programme. It is how we managed used nuclear fuel from the Magnox fleet of reactors, such as Calder Hall. These missions relied on the availability of support plants across the site; storage ponds where the fuel could cool, reprocessing buildings that could chemically separate the fuel into plutonium, uranium and waste products, waste and effluent plants and stores for the special nuclear materials.

In the mid-1970s there was a new fleet of nuclear reactors around the world that used a new type of nuclear fuel; Oxide fuel.

In 1978 the UK government approved the construction of a new building at Sellafield that brought as many of the facilities needed to reprocess nuclear fuel under one roof.

The result was the Thermal Oxide Reprocessing Plant, or Thorp as it is better known. Construction got under way in 1981 with the project dominating the Sellafield site and bringing thousands of contractors

### But Thorp wasn't just a feat of civil and nuclear engineering; it was also a big earner for the UK

to West Cumbria. The construction project was one of the largest of its time in Europe, beaten in size only by the Channel Tunnel and Disneyland Paris.

It took more than 5,000 people on site, supported by a further 10,000 jobs in the supply chain, to make Thorp a reality. What they created was a building that stretches for a third of a mile across Sellafield and one

that can receive and store used nuclear fuel, reprocess it and then deal with the resulting nuclear products.

To give you a sense of the scale of the building, Thorp's storage pond where fuel is

cooled before undergoing reprocessing is 73m long, 23m wide and 8m deep meaning it holds enough water to fill 20 Olympic swimming pools.

But Thorp wasn't just a feat of civil and nuclear engineering; it was also a big earner for the UK. It received used nuclear fuel from the UK's Advanced Gas-cooled Reactors and from Light Water Reactors in the UK and overseas, making billions of pounds for UK plc.

## THE END OF AN ERA

By the end of next year Thorp will have honoured all of its contracts and this chapter of our reprocessing mission will be finished. Our teams will then start the process of cleaning up the parts of the building that chemically separated the nuclear fuel. This will take a few years to complete.

With less than two years until the end of reprocessing in Thorp, preparations and planning are already well under way, not only for how the plant will be cleaned out but also in preparing the workforce for their future.

Colin Savage the post operational clean out facility lead in Thorp explains: "We have huge

set of working to production targets to one of cleaning out the plant will be a challenge.

"We are used to reprocessing, that is what we do and what we will continue doing until November 2018 but also we are planning for the future at the same time.

"We are working with the workforce to see where they see themselves after reprocessing. After 2018 fewer people will be required so the business is working through the options available.

"We will still need a large number of the workforce to carry out the post operational clean out of the plant and also for surveillance and maintenance but we can't hide from the fact that there are a number of roles that will no longer exist and so we are working now to address this, this may involve some training and reskilling so doing it two years in advance is the right thing to do."

### After 2018 fewer people will be required so the business is working through the options available

Thorp's receipt and storage ponds and facilities will continue to operate beyond 2018, and will continue to receive used fuel from EDF Energy's Advanced Gas-cooled Reactors. Instead of being reprocessed this fuel will be stored in the ponds pending a final disposition decision.

changes ahead of us, this is not only due to the fact that we won't be reprocessing anymore and the tasks we carry out will be different as we move into the post operational clean out phase, but culturally for the people who work in Thorp. Some of our people have been here since the beginning so adjusting from a mind-



In control – Operations carried out from central control room.

## Planning and construction timeline

1974	1977	1978	1981	1984	1988	1994
Public enquiry	Windscale enquiry held for 100 days	Parliamentary approval granted of BNFL's application	Site clearance begins	Major civil work starts	Thorp Receipt and Storage section opens and first irradiated fuel placed into storage pond	First active shear of fuel

# factfile

Thorp cost £1.87 billion to build

It had 34 customers in nine different countries

Earned £billions for the UK

Employed almost 5,000 people during construction

Supported 10,000 further jobs in the supply chain

Reprocessing ends in November 2018

Thorp is one third of a mile long

The storage pond is 73m long, 23m wide and 8m deep – that's enough water to fill 20 Olympic swimming pools

Thorp has now reprocessed over 8,500 tonnes of spent fuel

There are less than 850 tonnes of fuel to be reprocessed before completing in 2018

Thorp will have reprocessed approximately 9,350 tonnes of fuel when its mission completes



**Top:** Flask movements in Thorp.  
**Below:** Uranium that has been recovered during reprocessing is stored in line with international safeguards.  
**Bottom right:** Removing flasks from Thorp's pond.



**1997**

Plant fully operational

**2005**

Plant temporarily closed due to pipe failure in the feed clarification cell

**2012**

7,000 tonnes of fuel reprocessed

**2013**

Thorp receipt and storage celebrates 25 years of operations

**2014**

20 years of reprocessing

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FROM THE  
**ARCHIVES**



## Sellafield transport?

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We uncover some strange photographs during our trawls of the archives, but this is perhaps one of the most random. It dates back to the early 1960s and shows what was surely someone's pride and joy standing in front of one of the Windscale Pile Chimneys.



# Managing the **risk** **curve**

Reducing the hazard and risk in the 'big four' legacy storage facilities at Sellafield is our number one priority, as these buildings no longer meet modern standards. We are now seeing the culmination of years of preparation to install the major engineering work that will allow us to retrieve waste from these facilities. >

This means waking up the ‘sleeping giants’ and modifying buildings on a scale unlike anything in many years. It also involves performing unique tasks, never done before, anywhere. A truly constructive ‘G6’ approach between us, Government, the Nuclear Decommissioning Authority and our regulators is needed to operate in an environment where sometimes risk must go up before it can come down.

**F**aced with the task of communicating how dangerous smoking is, there’s one doctor who likes to flip a coin and say to his patient “Heads you live, tails you die. They’re the odds you’re taking by being a long-term smoker.” The flipside is another doctor who reassures his patients facing some routine procedure by saying “Do you know where the biggest risk is in going to the hospital and getting this done? It’s the drive there.”

Both of these approaches illustrate an understanding of the ‘odds’, which involves an assessment of what can go wrong.

Given the hazardous nature of the Sellafield site, we are fortunate to have some of the best people on the planet working here and making those assessments so they can put in place mitigating measures which manage risk

But no matter how rigorous our safety systems are, we cannot eliminate risk from our lives – either at work or at home.

All British industry is required by law to demonstrate that the risk to the workers, public and environment is maintained as low as reasonably practicable (ALARP). How this is achieved in some of our legacy facilities is very different to a modern plant. These facilities were built to the standards of the 1950s and ‘60s and they were not intended for waste retrievals or long-term storage of waste. While we can maintain these plants to an acceptable level of safety today, we cannot have the long-term depth of confidence in the structures and engineered systems that we have in our modern plants.

Removing the inventory therefore carries a level of urgency. We also have to work with the plants as they were built – and they weren’t designed with emptying in mind. So our work to remove the inventory has to balance urgency with uncertainty, and reach a compromise

between modern requirements for engineering solutions and the reality of the practicality of access we have.

In this environment every solution is unique and we need to compensate for the challenges thrown at us by the age and condition of the facilities with innovative and practical solutions.

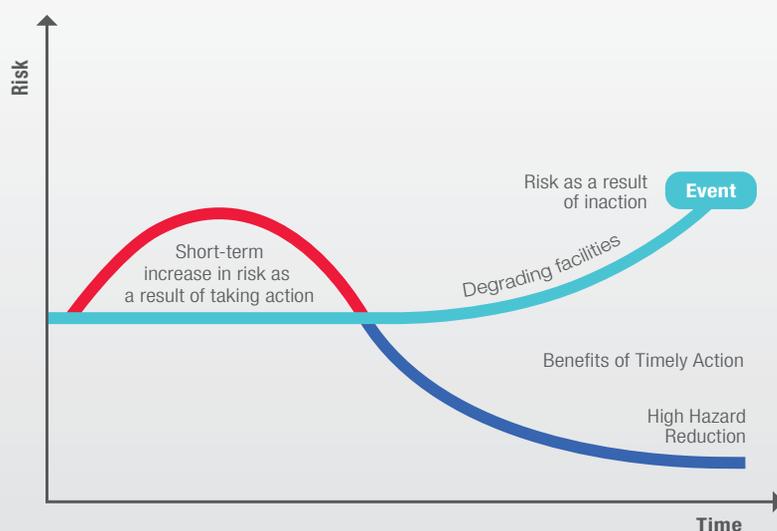
This involves relying heavily on our people to deliver the safest solutions possible. We sometimes call this approach ‘Decommissioning Mindset’ – where we cannot apply modern standard engineering, we have to re-define what the standards need to be on a case-by-case basis.

David Forsythe, our expert on risk-based nuclear safety, said: “Our modern plants achieve nuclear safety by virtue of their design

and construction. They have many layers of defence and if maintained and operated properly, they present a negligible risk to the public and environment. Think of them like modern airliners being flown by well-trained crews, staying within the safety envelope and following all the Air Traffic Control instructions. Flying by the book delivers a safe flight.

“Our legacy facilities are like older aircraft and need landing plans because flying indefinitely is not possible. The urgency of the landing plan dictates how we prepare for the landing. Balancing the urgency with the uncertainties of the performance of our old aircraft is how we deliver a safe landing plan. We cannot fly unsafely, we cannot subject the aircraft to flight conditions that will damage it, we cannot ignore

Hazard and Risk Reduction  
Holistic Balance of Risk (Programme ALARP)



**“Our legacy facilities are like older aircraft and need landing plans because flying is not possible. The urgency of the landing plan dictates how we prepare for the landing.”**

the risks. However, we recognise that this is different from flying by the manual and we need a real-time understanding of the aircraft's condition as we're landing it so that we can react accordingly. Issues that would be seen as unacceptable on a modern flight may be necessary because of the pressing and unavoidable need to land the plane.”

David explained that when we have less engineering to rely on and less certainty in the engineering we have got, the answer isn't to try and replace old with new, nor is it to try to make the older engineering perform as new. It would not be 'ALARP' to do that given the time that complex solutions would need. We ensure through investing in the performance of our people and balancing fit-for-purpose engineering with appropriate control measures, that we deliver the safest landing plans we can.

We therefore focus on enhanced 'people-based compensatory measures'. Our business is adapting to better develop, deliver and support them. It is recognising that each of our decommissioning programmes is unique; each landing plan has its own challenges. It means that the right standards and expectations delivered with the right leadership and upheld with the right human performance and operational tools will be playing a more vital role than ever before in this new era for decommissioning.

Now that Sellafield is entering an historic period for waste retrieval operations, it's a fitting time to recognise and appreciate the way we tackle risk with some of the examples seen here. We're showing innovation and pragmatism – while at the same time keeping safety our top priority. ➤

Lifting our thinking on safety: using cranes near hazardous buildings requires a different mindset.

## Risk Management: Case Studies

### Exporting fuel from the Pile Fuel Storage Pond

In February 2016, the last batch of bulk fuel was exported from the Pile Fuel Storage Pond, delivering a 70% reduction in the radioactive content in the facility. But the way the fuel exports happened – by lifting unshielded skips of fuel up and out of the water so they could be lowered into a shielded transport flask to be taken away – went against all conventional thinking in the nuclear industry.

Fuel storage ponds are designed to keep their fuel underwater at all times so the water can provide a protective barrier from the radiation ‘shine’ emitted from the material. We worked with our regulators to devise a process where the operators stood well away from the fuel behind temporary radiation barriers while the skip was moved in the air. The alternative would have been to design and manufacture a bespoke export facility that kept it shielded at all times – but this would have taken years and cost millions. The risk of what could go wrong if the fuel remained in its unsuitable storage conditions in this legacy pond was greater than the risk of lifting an unshielded skip out of the water in this stripped-down and simplified approach.



### Big crane lifts near hazardous buildings

When we installed the pipebridge to take sludge out of the First Generation Magnox Storage Pond, we carried out what was then the largest crane lift in the history of the site by lifting a 31-metre, 56-tonne pipebridge right next to a sensitive area with 10 vulnerable buildings. We did this safely by modelling the move with 3D design technology and trialling it off-site with an exact replica of the area using simulated buildings. We planned for two years for an operation which took one day.

The confidence that meticulous planning

and preparation gives us has allowed us to consider crane lifts for other operations. Installing the 40-tonne door installation frame on the Pile Fuel Cladding Silo was originally going to involve a complicated jacking system which would have taken months to install and operate. Instead a crane safely lifted it on to the retrievals superstructure within hours – allowing us to press on with hazard and risk reduction in this legacy facility.

### ‘Plan B’ Sludge Retrievals from the First Generation Magnox Storage Pond

In 2015 we spotted an opportunity to allow the active commissioning of the new plant which would receive sludge from the pond by activating a ‘Plan B’ temporary system ahead of the launch of the main bulk sludge retrieval system (see page 25 for more details on this).

The temporary solution was more reliant on people operating it than the more automated bulk system – it involved manoeuvring a floating platform which could then lower a hose (like an elephant’s trunk) from the pond surface. As there was the potential for the equipment to be damaged or blocked if deployed in the wrong area, we made the procedure more robust by boosting the human performance element. We had an ROV operator sitting beside the sludge hose operator so they could be the ‘eyes’ in the pond looking out for anything which could compromise the operation. Another operator was also on hand to check and monitor that the sludge retrieval equipment was operating safely and blockages weren’t causing issues which could damage the equipment.

If we were to design a sludge retrieval system which needed to run for years, then we wouldn’t make it so three people are needed to operate it safely. But in order to deliver a short-term solution which had wider benefits and could operate at a level of risk which was acceptable, it was the right thing to do.

### Installing the Silo Emptying Plant machines in the Magnox Swarf Storage Silo

Three huge waste retrievals machines are being installed at the top of the most hazardous facility on the Sellafield site, the Magnox Swarf Storage Silo. The first machine, SEP 2, has now been fully assembled and the final machine will be assembled by 2021. Each machine weighs around 360 tonnes – so we will be putting the

equivalent weight of around six blue whales on the top of this legacy facility once all of the machines are in. While this additional weight is a similar load to the original machinery used to deposit the waste, there is a risk that the change in structural loading on the building could open up historic small cracks in the silos and radioactive liquor could seep into the ground underneath the facility. There is already localised contamination in the ground underneath the building due to some seepage in the 1970s, but experts are confident those cracks have since self-sealed and the conditions which led to them appearing won’t be repeated.

There is a containment risk regardless of whether we put the SEP machines in or not – the older the facility gets, the less suitable it is for storage. Therefore the best way to reduce the risk is to install the waste retrieval machines as quickly as we can (while still doing so safely). A vast amount of work has been carried out to determine the adequacy of the facility for waste retrieval. This includes extensive computer modelling of the building structure, using the most onerous load configurations.

There is already an extensive site network of boreholes for routine monitoring of the underground water to provide information on any spread of contamination. Five new boreholes were installed near the facility in 2016 to enhance this network. We have also modelled ‘worst case’ scenarios for the way any contamination could move underground to reassure ourselves and our regulators that we have appropriate measures in place to monitor and manage any contamination migrating to the site perimeter.



**“Given the nature of these facilities and the critical importance of removing the hazard to reduce the risk, everybody in the system has to be flexible and aware of the bigger picture so that the job can get done whilst ensuring appropriate margins of safety and security.”**



## Regulating Risks

### How the Office for Nuclear Regulation (ONR) enforces the ALARP approach

Dr Matt Worsley is the ONR Inspector who oversees the mission to retrieve waste from the Pile Fuel Cladding Silo. As this involves cutting six holes in the side of a ‘sealed vault’ which has held Intermediate Level Waste undisturbed for around 50 years, it is understandable that ONR needs to be sure that operations will be carried out safely and securely.

Any modifications to a facility or its operations which have the potential to cause an off-site nuclear incident if they were to go wrong are put forward in what are called ‘Category A’ plant modification proposals. They are part of the day-to-day routine at Sellafield – not because we’re happy to run the risk of releasing nuclear material into the environment, but because of the hazardous nature of the site. All of these operations are underpinned by a safety case and have appropriate hold points so that checks can be made at the right time before proceeding.

Unlike an OFSTED inspector who may visit a school for a few days a year or a Health and Safety Executive inspector paying a visit to a local garage, Matt has much more regular engagement with the Sellafield site and the regulator/licensee relationship is different.

“I have to work constructively with the silo’s programme delivery team as it wouldn’t be in anyone’s interests for them to start developing a proposal we’re not comfortable with and then stop work that’s already in traction. Similarly I

can be there to say ‘no, you look to be over-engineering this and it might be better, in terms of the overall risk profile, to consider something simpler but that could lead to faster and more efficient waste retrieval!’”

So, while ensuring adequate regulatory control, part of his role is to constructively encourage Sellafield Ltd to think and work differently to deliver risk and hazard reduction safely and securely.

The Retrievals Access Penetration, where the six large circular holes are cut into the side of the silo so that the retrievals equipment can extend inside to grab the waste, is being carried out in spring 2017. ONR specialist inspectors travelled to a mock-up replica wall in Rosyth last year to see the operation being carried out and gain confidence that the risk was as low as reasonably practicable.

“We need to be confident that Sellafield Ltd can do this safely and has properly thought through what could potentially go wrong, how likely that is, what the consequences would be, and what the mitigating measures are to sort things out if there’s a problem,” said Matt. “Demonstrating that the work can be undertaken safely is Sellafield Ltd’s responsibility – the key for ONR is to ensure that Sellafield Ltd people are providing the right level of challenge and review, and that the site’s rigorous internal due process is being followed.”

The ONR works closely alongside other nuclear regulators, such as the Environment Agency. For example, when assessing the safety of using water jet cutting to remove the deflector plates inside the silo, the ONR’s work on analysing the risk of hydrogen build-up meant that the Environment Agency could focus on how any effluent or water discharge would be managed rather than the aerial discharges.

The regulators also accept that we’re operating in a different environment from modern facilities and a different perspective on risk is needed to progress with the mission. “If we knew Sellafield Ltd was going to be doing water jet cutting for the next 20 years, then it is likely that a more highly-engineered system would have been needed rather than the manual tooling being used. However, given that it’s a short duration, bespoke operation, the fit-for-purpose approach allows us to accept some increase in the short-term risk in order to make faster progress towards the longer-term risk reduction,” said Matt.

“Given the nature of these facilities and the critical importance of removing the hazard to reduce the risk, everybody in the system has to be flexible and aware of the bigger picture so that the job can get done whilst ensuring appropriate margins of safety and security.” ■



# Board's eye view: Nigel Smith

From apprentice to the President of a company with a £1.5Bn turnover, our non-executive director, Nigel Smith, brought a wealth of commercial, major programmes and procurement knowledge from the technology and industrial sectors to the Board, when he joined in 2011. How does he think the company has changed in the last six years and what challenges lay ahead?

**H**aving worked at the top of his profession in a public and private capacity, Nigel Smith brings invaluable experience to our Board.

He started his career as an apprentice at Dowty Aerospace where he studied commercial and business studies. During his twenty years at the company he progressed from personnel manager to managing director of two divisions while developing skills in finance, people management, commercial and negotiation, and international business through his work in the Far East, Europe and USA.

This experience led to senior positions including managing director of commercial products at GEC – Marconi, overseeing their development of such items as the video telephone and microwave systems; Chief Executive of Charter plc – a FTSE 250 company; and President of Invensys Rail Systems where he managed the strategic direction and business performance of the global rail division.

In 2007 he was appointed as Permanent Secretary in HM Treasury and Chief Executive of the Office of Government Commerce, leading the drive to modernise government procurement, major programmes, the central property estate and deliver value for money. This 'permanent secretary' role involved him joining the HM Treasury Board.

Nigel said: "I received the civil service

appointment due to my commercial and procurement experience in successful national and global businesses. During this period I looked after all major programmes, and this is when I came across the nuclear industry as I carried out the review of the decommissioning programme in 2008."

He joined our Board in April 2011, and said:

**"I have brought commercial experience with a major programmes background in International businesses with safety critical products and systems. This is particularly relevant given the significant contracts and programmes at Sellafield with safety and security as its number one priority."**

Reflecting on the change to the company over the past five years, he said: "Sellafield is fundamentally different now. When I joined the Board I felt we had a number of weaknesses in our strategy, major programme and commercial activities, but over the past two years there has been a massive step-change.

"The capability is much stronger, we have a clear strategy – which I strongly support – and we are ahead of time on key activities.

"We all know there has been great progress in recent times, for example in legacy ponds and silos, and this is fantastic news. However there are still plenty of areas where we need to improve, such as embedding commercial third party partnering arrangements and major programmes capability. This is crucial given the proportion of money we receive from the Nuclear Decommissioning Authority that is spent through our supply chain and the need to deliver our major programmes in a timely and cost-effective manner, underpinned by a relentless focus on safety and security."

Nigel added: "Developing our people is crucial to everything we do. The work at Sellafield is of national importance – it's the largest industrial site in the UK – and we should all be immensely proud of the work that we do every day.

"I look forward to seeing continued success at the site, and to supporting the continued implementation of major programmes at Sellafield."

Nigel also has other roles outside of our organisation. So how does a busy executive relax? "I get real enjoyment from work, but my favourite pastimes are with my family, walking my dog (a Giant Schnauzer), playing golf and spending time abroad."

# Tim Chittenden steps down

The longest serving member of our board, Tim Chittenden recently stepped down after nine years of service.

Originally appointed for a three-year term, Tim provided wise leadership and counsel to the business during a period of significant changes, including the transition of our company from the ownership of Nuclear Management Partners to the Nuclear Decommissioning Authority.

Tim brought to the Board his expertise in managing large projects from his navy career and his health and safety role with BAE Systems in Barrow.

Our company secretary, Andrew Carr, said:

**“TIM HAS BEEN EXTREMELY HELPFUL; ALWAYS QUICK TO OFFER HIS SUPPORT AND ASSISTANCE AND TO BRING HIS KNOWLEDGE OF THE NUCLEAR INDUSTRY AND SELLAFIELD TO BEAR.**

“It was a real pleasure to have the opportunity to work alongside him on the Board and he will obviously be a big loss. We are fortunate that we have two new non executives who bring similar strengths to the Board – Anne-Marie Choho and John Baxter.”

During his time on the Board, Tim took a leading role in the creation of our Code of Responsible Business Conduct, and the implementation of the Bribery Act principles, improving our corporate governance.



## Prince Philip visits Sellafield

The Duke of Edinburgh was given a guided tour of Sellafield in October to see the world-leading engineering and innovation being used to clean-up the site.

He was accompanied on the visit by the Lord Lieutenant for Cumbria, Claire Hensman, and members of the Sellafield Ltd and Nuclear Decommissioning Authority Executive and Board.

Phil Hallington, head of policy at Sellafield Ltd, had the special honour of taking the Duke on a guided tour of the site.

He said: “Today has been a real honour for everyone at Sellafield Ltd, the Nuclear Decommissioning Authority and the hundreds of businesses in our supply chain network.

**“IT’S BEEN A WONDERFUL OPPORTUNITY TO SHOWCASE THE REMARKABLE SKILLS AND CAPABILITIES OF OUR EMPLOYEES AND SUPPLY CHAIN, AND THE PROGRESS WE ARE MAKING IN SAFELY CLEANING-UP EUROPE’S MOST COMPLEX NUCLEAR SITE FOR THE BENEFIT OF THE UK AND THE WORLD.”**

During his visit, the Duke also met with employees who not only drive forward the Sellafield mission, but also hold crucial voluntary roles – from emergency service volunteers to flood recovery heroes – within the local community.

A white rectangular frame is centered on the page. Inside the frame, there is a paragraph of text. The text is in a magenta color. The first part of the text is in bold, and the rest is in a regular weight. The text is centered within the frame.

**How do we remove intermediate level waste from one of our legacy ponds at Sellafield a decade ahead of schedule?** We look to our friends at Berkeley and follow their lead in developing an alternative interim storage solution. Saving money, sharing learning across the nuclear estate and accelerating risk reduction; that is the Nuclear Decommissioning Authority's strategy in action.

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# Simple by design

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## INTERIM STORAGE FACILITY

**H**ow do we solve a problem like Zeolite? The material was used in skips to extract the caesium from the pond water in our oldest storage pond; the First Generation Magnox Storage Pond. More than 200 of these Zeolite skips were used until the mid-1980s and since then have been classified as intermediate level waste that needs to be removed from the pond.

Our original plan was to take the skips out of the pond still full of water, transfer them to a new facility – the Box Encapsulation Plant – drain them of water and then grout them inside a box, at which point they would be suitable for storage ahead of final disposal in a geological disposal facility. The only downside to this plan was that the Box Encapsulation Plant won't be available for several years, thus impacting on our ability to accelerate hazard and risk reduction at Sellafield.

Meanwhile, our friends at the Berkeley nuclear site had developed an alternative approach to intermediate level waste; interim storage in boxes that not only provided containment, but also radiological protection.

Dr Brian Burnett, head of programmes at the Nuclear Decommissioning Authority, said: "In 2010, Berkeley was the first Magnox site to place its two reactors into safe store. The focus now is on retrieving, packaging and storing the waste on site to enable Berkeley to enter care and maintenance."

In April 2016, the Nuclear Decommissioning Authority published the third iteration of its strategy for the clean-up of the UK's civil nuclear estate and highlighted the potential to better share learning between sites, particularly in waste management. One of the key principles of the strategy is that the authority should 'where appropriate, provide leadership giving greater integration across the estate and the supply chain, in particular by seeking opportunities to share treatment and interim storage assets, capabilities and learning'.

Following in the footsteps of the team at Berkeley, our new plan for the zeolite skips is to lift the skips out of the pond full of water, place them directly into specially manufactured self-shielded boxes and then store those boxes in an interim waste store.

The shielding provided by the storage box means it can be stored in a relatively simple (and therefore quick to build) building like the one constructed at Berkeley, rather than a heavily shielded structure.

The new approach means that we can start to remove the skips from the First Generation Magnox Storage Pond a decade ahead of schedule because we don't need to wait for the new Box Encapsulation Plant to be built. Removing the skips will free up space in the pond, making the rest of the clean-up mission much easier – a bit like de-cluttering before you do the housework. ■

# Stack demolition gets under way

**Work to remove the now redundant 61 metres Primary Separation Plant chimney stack is now progressing, following regulator approval. Here we outline the progress made since we covered it in the last *Sellafield Magazine*.**

In the October 2016 *Sellafield Magazine* we showcased the complex project to demolish the chimney stack that currently stands on top of our Primary Separation Plant.

This is a particularly challenging project due to the location at the heart of a congested nuclear site, adjacent to other high consequence facilities. This means that conventional demolition methods are not an option.

Since October, the project has received a licence to proceed from our independent regulator, the Office for Nuclear Regulation.

This meant that work could begin in earnest in November 2016. The first act was for the self-climbing platform to ascend the stack, so that the final tasks to complete the platform could be undertaken.

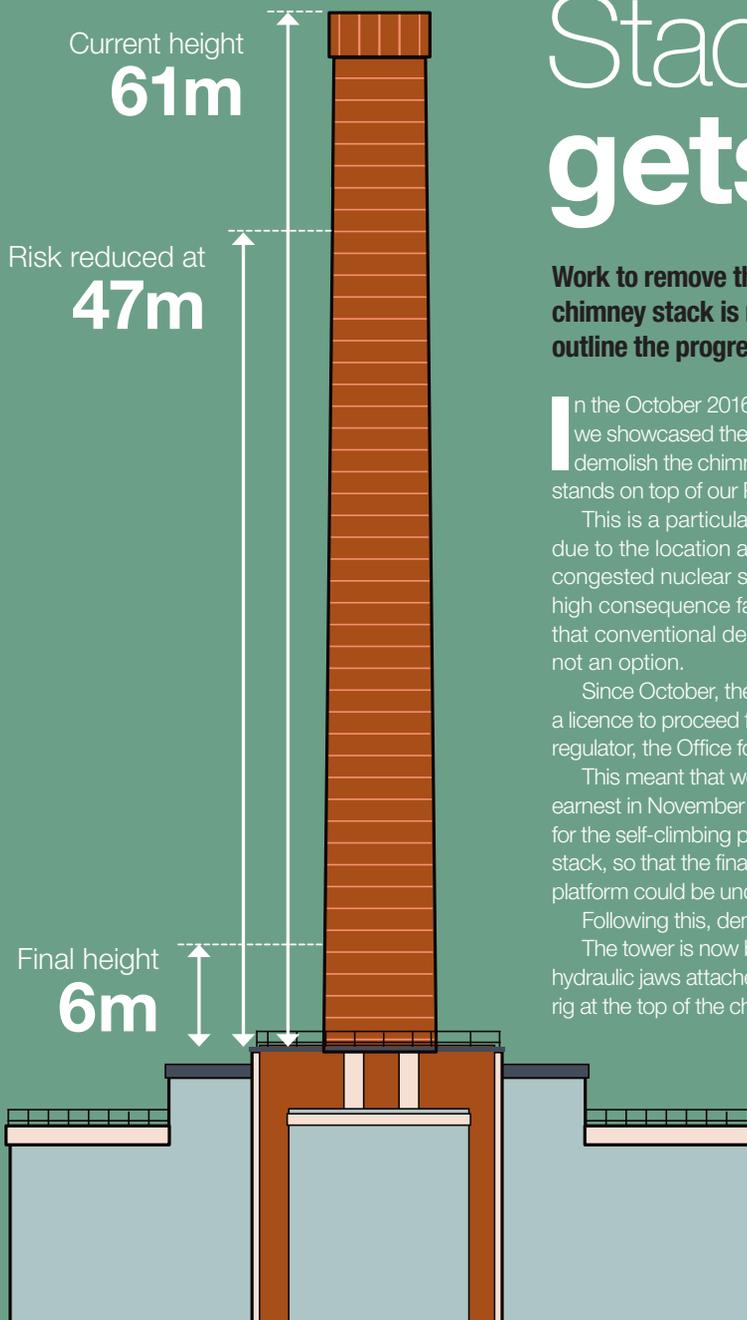
Following this, demolition got under way.

The tower is now being nibbled away by hydraulic jaws attached to a circular working rig at the top of the chimney.

As we cannot allow rubble to fall to the ground, or inside the stack, it is being transported, via a lift, to the ground in small containers – a meticulous and time consuming task.

The highest level of risk will be reduced once the stack is demolished to a height of 47 metres later this year. The stack will be reduced to its final height of six metres by the end of 2018.

This project has benefited from a collaborative approach to risk management developed to break down barriers to progress at Sellafield. This 'G6' way of thinking is so called because it is a collaboration between the six organisations with responsibility for the safe and effective clean-up of the site; ourselves, the Office for Nuclear Regulation, the Environment Agency, the Nuclear Decommissioning Authority, the Department for Business, Energy and Industrial Strategy, and UK Government Investments. On this project, following discussions by the G6, the weather window in which operations could be undertaken was reviewed and expanded.



## TWO DOWN, TWO TO GO

We have reached another milestone in the clean-up of Calder Hall with two of the former power station's four reactors now completely empty of fuel. We are still on course to remove the fuel from the final two reactors by the end of 2019. All of the used fuel will be reprocessed in the Magnox Reprocessing Plant on site.

# The Final Countdown

We are close to completing our reprocessing mission at Sellafield.

We have been reprocessing used nuclear fuel at Sellafield since the 1950s. As part of the site's early operations, fuel from the Windscale reactors was reprocessed in order to capture the plutonium needed for the UK's atomic weapons programme.

Used fuel is reprocessed by stripping the outer cover from fuel, dissolving the fuel and using chemical processes to separate uranium and plutonium from waste materials.

There are two buildings at Sellafield that are dedicated to reprocessing different types of nuclear fuel; the Magnox reprocessing plant and the Thermal Oxide Reprocessing Plant – or Thorp as it is better known.

## Best of the best

**One of our mechanical design apprentices, Adam Sharp, beat strong competition from the best apprentices in the country to be named the Advanced Level Apprentice of the Year at the recent National Apprentice Awards.**

Moving across the country on his own in order to carry out his apprenticeship with us, mechanical design apprentice, Adam Sharp, didn't just have to get to grips with the world of work, he also had to grow up overnight.

Adam's commitment and unquenchable thirst for learning and development have seen him scoop an armful of accolades during his apprenticeship, and now he can add national Advanced Level Apprentice of the Year to his collection.

He said: "My apprenticeship has given me the skills I needed to become an engineer, but it has also given me more general life skills. I moved over 150 miles on my own at the age of 18 so that I could be an apprentice at Sellafield. Council tax, cooking and household bills were all unfamiliar things. I had to grow up quickly, manage bills, budget myself and learn life skills such as cooking. I had to become an adult.

"The apprenticeship programme has given me all of the practical training and skills that I need for my career as well as opportunities that I never dreamed of, like being part of a tall ship crew in a journey across the Irish Sea! A traditional university route into work couldn't have given me the experiences and practical skills that an apprenticeship has.

"To receive a national award like this, to have even been shortlisted with the best apprentices in the country, is just the icing on the cake."

The awards, run by the National Apprenticeship Service, are now in their 13th year. They recognise both employers and apprentices from across England that can demonstrate how apprenticeships have made a real difference to their organisation and careers. ■



### Magnox reprocessing

Used fuel from the UK's fleet of Magnox reactors, including our own Calder Hall, is reprocessed in the Magnox reprocessing facility. Our ability to take the fuel from the stations in line with an agreed programme has been a critical support to their electricity generating programme.

**Tonnes to go: 1,641**

As of 23 January, there are 1641 tonnes of Magnox fuel to be reprocessed until closure of the Magnox operating programme.



### Thorp reprocessing

Thorp reprocesses Oxide fuel from both UK and overseas customers and, at the height of its operations, was the biggest Yen earner in the UK. Revenue from both Thorp and Magnox reprocessing is used to help fund our risk and hazard reduction mission.

**Tonnes to go: 774**

As of 23 January, there is 594 tonnes of Advanced Gas-cooled Reactor fuel and 180 tonnes of Light Water Reactor fuel to be reprocessed. We have also received sanction from the Nuclear Decommissioning Authority to reprocess an additional 220 tonnes of Advanced Gas-cooled Reactor fuel before Thorp's planned closure date of November 2018.

# Measuring our performance at Sellafield

Every year we agree what acceptable, good and excellent performance at Sellafield looks like in our key areas of delivery.



### DOWNLOAD

To download a copy of the performance plan visit [www.sellafieldsites.com/press/performance-plan/](http://www.sellafieldsites.com/press/performance-plan/)

### LATEST NEWS

To keep up to date with our performance, visit [www.sellafieldsites.com/news/](http://www.sellafieldsites.com/news/) or [www.nda.gov.uk/what-we-do/our-priorities-and-progress](http://www.nda.gov.uk/what-we-do/our-priorities-and-progress)



In Issue 3 of *Sellafield Magazine* we published these targets – or success criteria as we know them – for the 2016/17 financial year. The table opposite shows our performance against these targets so far.

You can keep up to date with the progress we are making in the clean-up of Sellafield, as well as our performance in our commercial and waste management operations, by visiting [www.sellafieldsites.com](http://www.sellafieldsites.com)

1947

Construction of the nuclear facilities commenced

2 square miles

Area of Sellafield site

>100

No of nuclear buildings

619,000 tonnes

Sellafield site steam usage 2015/16

266,100 MWh

Sellafield site electricity consumption 2015/16

# Key information and data 2016/17

## Success Criteria – Key Milestones 2016/17

	Operating Plan Target	Pd5 Forecast	Acceptable	Good	Excellent
HAL: Evap D – Completion of Water Throughput Trial 5	Nov-16	Apr-17	Jan-17	Nov-16	
PFCS: Waste Retrievals Containment Areas – Prelim Design	Oct-16	Complete – Jun-16	Nov-16	Oct-16	Jul-16
PFCS: Silo Door Installed on Compartment 5	Nov-16	Complete – Sep-16	Dec-16	Nov-16	Oct-16
Decomm: 3m <sup>3</sup> Box Production Plan Approved	Sep-16	Complete – Aug-16	Oct-16	Sep-16	Aug-16
Remediation: Demolition of Stack to 39m level	Oct-16	Jun-17	Nov-16	Oct-16	Sep-16
FGMSP: Strategic Decision on use of Self Shielded Boxes	Aug-16	Complete – Aug-16	Sep-16	Aug-16	Jul-16
FGMSP: D-Bay Complete D3 & E3 Isolations	Mar-17	Feb-17	Apr-16	Mar-17	Feb-17
MSSS: SEP 2 Installation Complete	Oct-16	Complete – Oct-16	Mar-17	Oct-16	Earlier than Oct-16
ISO: Approval of ATOS Extension Options	Sep-16	Complete – Sep-16	Sep-16	Sep-16	Sep-16
Infra: Fellside Boiler Park Complete Stage 3 Commissioning	Mar-17	Aug-17	Apr-17	Mar-17	Feb-17
Infra: Analytical – Approval of IPDG Business Case	Aug-16	Complete – Aug-16	Oct-16	Aug-16	Jul-16
BEP: Delivery of Low Active Effluent Vessel	Sep-16	Complete – Sep-16	Oct-16	Sep-16	Sep-16
BEP: Area 600 Detail Design Complete	Nov-16	Complete – Dec-16	Dec-16	Nov-16	Oct-16
SAV: Project Complete	Jun-16	Complete – May-16	Jul-16	Jun-16	May-16
SRP: Concept Design Complete	Aug-16	Complete – Jul-16	Aug-16	Aug-16	Jul-16
DESf: First Fuel Shipment received with all cans in store	Sep-16	Complete – Sep-16	Oct-16	Sep-16	Aug-16
SERP: Island Sites – Fully Operational	Jan-17	May-17	Mar-17	Jan-17	Dec-16
SERP: Cyber Protective Monitoring in Place	Dec-16	Oct-16	Mar-17	Dec-16	Oct-16
SERP: MSCF Piling Construction Complete	Nov-16	Complete – Sep-16	Dec-16	Nov-16	Sep-16
AILWA: Design Complete (incl HAZOP II Studies)	Jan-17	Dec-16	Feb-17	Jan-17	Dec-16
Site: Approval of Target Operating Model	Nov-16	Complete – Aug-16	Oct-16	Oct-16	Aug-16
Site: Introduction of revised T&Cs for New Starters	Aug-16	Complete – Jun-16	Sep-16	Aug-16	Jul-16

## Key Production Metrics

		Actuals	Actuals	Forecast	Target	Acceptable	Good	Excellent	Target	Target
		15/16	Qtr3 YTD 16/17	YE 16/17	16/17	16/17	16/17	16/17	16/17	17/18
PFSP	Active Commissioning Sludge Removal (drums)	NEW	4	20	10 Exported & 4 to Store	10 Exported & 4 to Store	30 Exported & 24 to Store	40 Exported & 32 to Store	Target not identified in Operating Plan	
HLWP	Vitrification (teU)	1304	418	950	1130	853	1035	1130	1279	1327
FGMSP	Fuel Exported to FHP (teU)	NEW	34.5	45.9	45	30	45	51	Target not identified in Operating Plan	
MAGNOX	Reprocess Spent Fuel & DFR Materials (te)	389	353	500	457	420	457	500	527	538
	Receipt of Spent Fuel (te)	376	194	365	365		Not Applicable		497	287
	AGR Fuel Receipts (te)	176	130	192	192		Not Applicable		192	178
THORP	Shear Oxide Fuel (te)	460	355	427	417	372	417	427	450	135
	TR&S MEB Removals	105	54	54	54		Not Applicable		130	98
Safe Store Pu	Transfer Cans to SPRS	733	425	536	512	488	512	536	517	361

## Major Procurements Placed & Planned

Procurement Scope	Estimated / Awarded Value	Contract Award Planned
Decommissioning Delivery Partner	£1bn	Jan-2016 – Complete
Cranes	£58.7m	Mar-2016 – Complete
Tanks & Vessels	£18.9m	Jul 2016 – Complete
Multi Discipline Site Works / Operations Site Works	£160m	Mar-17
Technical Services Strategic Partner	£750m	Apr-17
SIXEP Contingency Plant	£163m	Jul-17
CHP & Fellside Boiler Park Maint & Mgmt Agreement (OM & MA)	£98m	Apr-18

## Capital Projects

Top 10 by Value (P50 £m; 2016mv)	Total Planned Cost to Go	16/17	17/18	18/19
Box Encapsulation Plant	623	114	167	138
Replacement Analytical Project	459	8	17	38
Sellafield Product & Residue Store Retreatment Plant	458	12	27	30
SIXEP Waste Management	420	1	3	1
SIXEP Contingency Plant	385	18	19	45
SEP Solid Waste Storage Retrievals	382	82	74	64
Electrical Supply – New Construction	371	7	24	54
Pile Fuel Cladding Silo Early Retrievals	273	57	83	71
SPP1 Process & Export Facility	267	0	1	1
FGMSP Wetbays Residual Recovery Capability	254	0	0	6
All Other Projects	3,566	475	372	352
<b>Total</b>	<b>7,458</b>	<b>773</b>	<b>788</b>	<b>801</b>

\*Excludes BUFT & DILWEP as subject to Change Control

**Sellafield poses one of the UK's most complex challenges, and many stakeholders rely on us for diverse reasons.**

**For example, our communities rely on us to keep them safe. The UK (and beyond) relies on us to reduce hazard and risk. We play an important role in the nuclear industry worldwide.**

**As our revenues fall, the government needs us to deliver increasing value for money. Impending changes to the Sellafield mission offer us a real opportunity to do things differently, and to build on our achievements to better meet those needs.**

**It won't be easy, but transforming Sellafield will create a positive impact for our organisation, for our local communities and for the UK as a whole. >>>**

# Transforming



Sellafield has a rich history, and has adapted a number of times to respond to changing national priorities. Our first role as an inspection site for munitions during World War II gave way just a few years later to the production of plutonium, in support of the atomic weapons programme. Reactors, ponds, waste silos and support facilities were constructed, and the United Kingdom Atomic Energy Authority (owners and operators of the site at that time) put in place all the processes and management systems needed to support this new mission.

Fast-forward to the end of the 1950s, and the site was called upon to deliver a new national objective – the production of electricity through nuclear power. Calder Hall was built, along with an additional pond and silo and various support buildings. Physical structure aside, the organisation had to change some of its ways of working too, to accommodate this new work.

When the UK Government gave the go-ahead to the then site owner/operator British Nuclear Fuels Ltd to reprocess used nuclear fuel from reactors around the world,

Sellafield generated a substantial income for the national economy. Once again, the organisation and its infrastructure adapted to respond to the changing site mission.

It is relatively easy to look back at change, and the benefit of hindsight allows us to see the outcomes of those transformations over the past seven decades. It is more difficult to look ahead and predict the extent and impact of the changes yet to come.

This is where we find ourselves: on the cusp of the next chapter of Sellafield's story.

# Sellafield



**T**he nationally important mission for the site now is the clean-up of the facilities that have supported the site's previous roles. These buildings were not built with decommissioning in mind, and they represent some of the highest hazards and risks in the country.

In addition, we have a mission coming to an end – within the next four years, reprocessing operations will cease in both the Thermal Oxide Reprocessing Plant (better known as Thorp) and the Magnox Reprocessing Plant and we will move into routine high hazard retrievals and decommissioning.

We are in the fortunate position where we can see already how our business is changing, and we are taking steps now to prepare for it.

First and foremost, our priority is the safe and secure stewardship of the Sellafield site, and the delivery of our mission. Our ambition is to transform Sellafield so that it is recognised as a leading nuclear enterprise and as a national asset, while holding this core purpose at the heart of everything we do.

Transforming Sellafield will mean we make our communities and environment safer sooner and demonstrate our nuclear capability for a longer-term future. At the same time, we want to support a positive and sustainable impact on our regional economies.

We are building on some noteworthy achievements as we transform. For example, we have removed the last of the fuel from our Pile Fuel Storage Pond, and removed some of the highest hazards from the First Generation Magnox Storage Pond for the first time. We have also built a new ventilation stack, or chimney, which meets newer and safer standards and allows us to begin removing some of our older stacks – removing risk and changing the Sellafield skyline.



**O**ur forthcoming change in mission is an opportunity to think differently. We are transitioning from reprocessing into routine high hazard retrievals and wider decommissioning activities – but at the same time we must become more efficient and agile, while remaining safe and secure.

Reducing the highest levels of risk at Sellafield is the biggest environmental clean-up in Europe, perhaps in the world. This means operating as a remediation and waste management company rather than as an energy or reprocessing organisation.

Transforming Sellafield will help us remove high hazard faster. This is because simplified ways of working and clearer priorities mean we can get work done more easily. We will also reskill and redeploy resources, following the end of reprocessing, to accelerate our high hazard mission.

Transformation is a wide-ranging ambition, and will affect our working practices, our structures, and our supply chain relationships.



Our day-to-day work at Sellafield is delivered through a combination of what we do using our own in-house expertise and what we buy from our supply chain. We know that the balance of this approach will likely change over time. As we finish the reprocessing mission, we may choose to do more to accelerate hazard reduction instead; in the longer-term we might want to do less in-house and instead help to grow a larger supply chain that can exploit wider commercial opportunities and in turn help to grow and diversify our local economies.

As we transform, we want to find ways to work more collaboratively with our supply chain, so that everyone working at or with Sellafield knows that they are part of an 'extended enterprise'.

It will be important to simplify the way we work with our supply chain, to make it easier to do business with us and to reduce as much red tape as possible for everyone.

We've seen early progress on this recently, as we've agreed with our owner, the Nuclear

Decommissioning Authority, to remove the potentially onerous burden of intellectual property ownership from all but a few pertinent contracts. This will benefit the majority of our suppliers, who had identified this as an issue and who will now retain their own intellectual property.

Within our own organisation we are looking at how we do work and making sure that every activity is helping us to deliver our priorities, and adding value. As such, the backbone of our transformation programme is the creation of four value streams. This simply means that we are aligning all of our effort and resources to the four core streams of work at Sellafield; the retrieval of fuel from our ponds and silos, the remediation and clean-up of the site, the management of spent fuel, and the management of special nuclear material.

By arranging our work around these streams, we can make sure our continuous improvements are the right ones and that we are investing time and money on what really matters.

We are also looking at the business

processes that help us work better and faster – simplifying our work, for example, and cutting unnecessary red tape. This way we can get work done faster and more efficiently, and remove hazard and reduce risk as quickly as possible.

We will build an agile organisation that is the right shape and has the right skills to move fast and respond both to opportunities and issues. We will work more closely with our supply chain, and encourage innovative thinking to find new and better solutions to our complex challenges.

Transforming Sellafield will take us through uncharted territory. Transformation is about reinventing an organisation, rather than following a sequence of defined steps to reach a detailed future state. Transformation can be unpredictable, and it is certainly iterative – that is to say, the next steps of the journey are uncovered as the organisation transforms. When future generations, with the benefit of hindsight, look at this chapter of Sellafield's story, they will see a site that no longer poses a risk to the environment, a site that sits as part of a thriving and diversified economy, and a site that can respond to whatever challenge comes next. ■

“ It will be important to simplify the way we work with our supply chain, to make it easier to do business with us and to reduce as much red tape as possible for everyone.”



A close-up photograph of a person's hand, wearing a gold ring, pointing at a technical drawing or map spread out on a table. The drawing features various lines, circles, and text, typical of an engineering or project plan. The background is a blurred office setting with blue lighting.

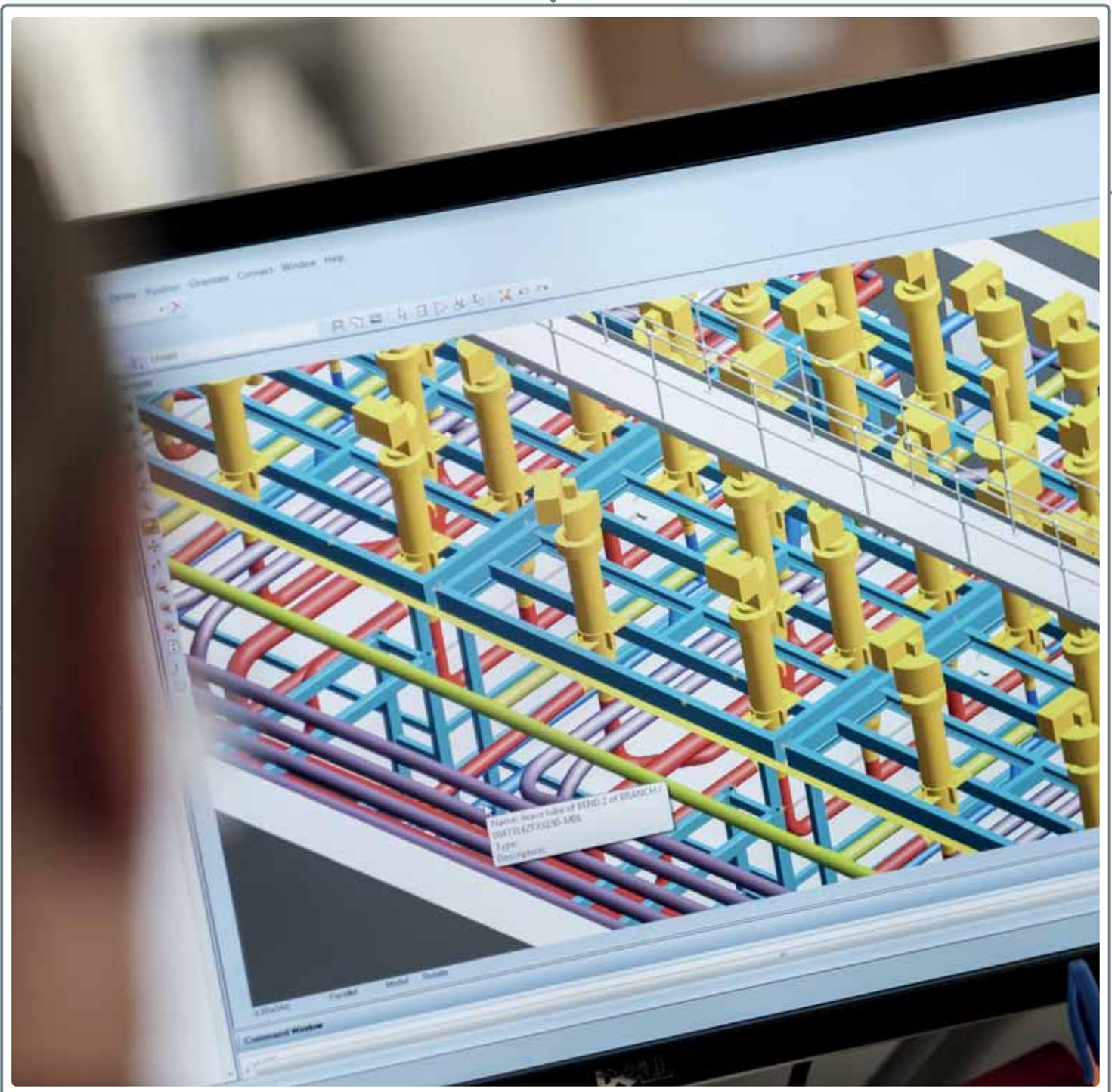
# PROJECT MANAGEMENT

Our ability to retrieve radioactive sludge, fuel and wastes from redundant buildings at Sellafield that date back to the 1950s, relies on the availability of modern, engineered buildings that can receive, treat and store the materials. Sometimes we are able to use existing waste treatment and storage facilities on the site, but sometimes we need a new solution.

The delivery of projects at Sellafield relies on collaboration and close working with the planning authorities, our supply chain, and the people who will ultimately be responsible for operating a new facility. From drawing board to commissioning, our project teams are changing the Sellafield skyline. >>

**PROJECT PLAN AND DESIGN**

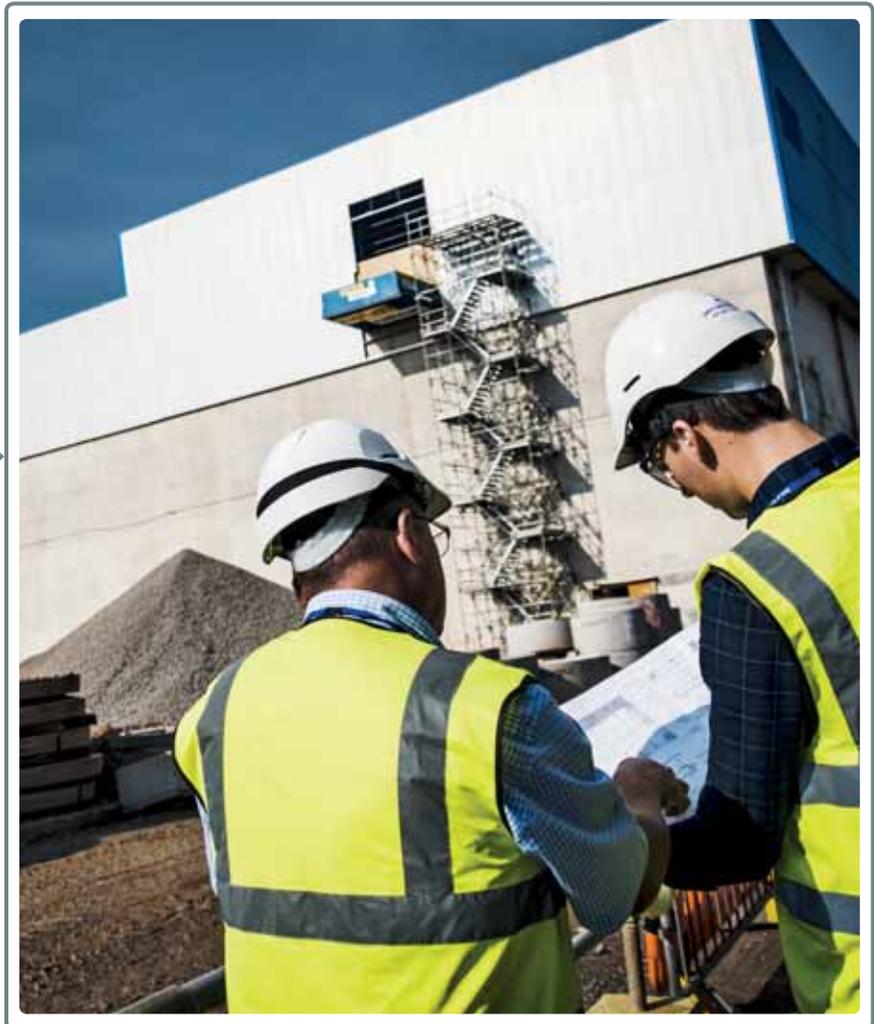
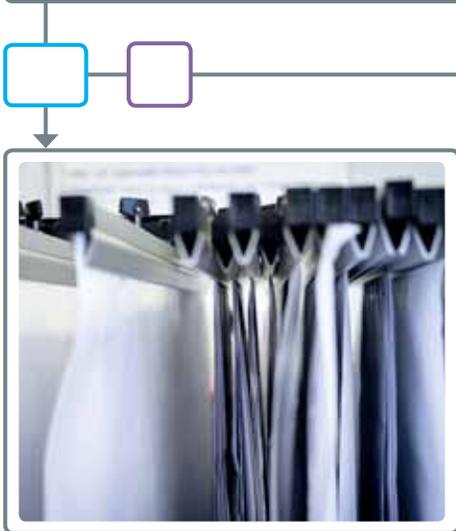
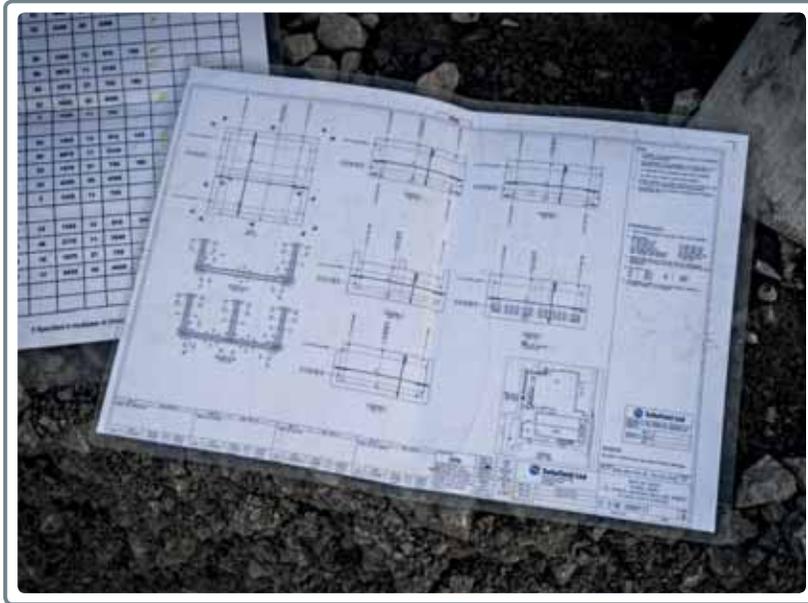
DURING THIS EARLY STUDIES PHASE WE AGREE THE OBJECTIVES OF THE PROJECT AND START DESIGN. >>

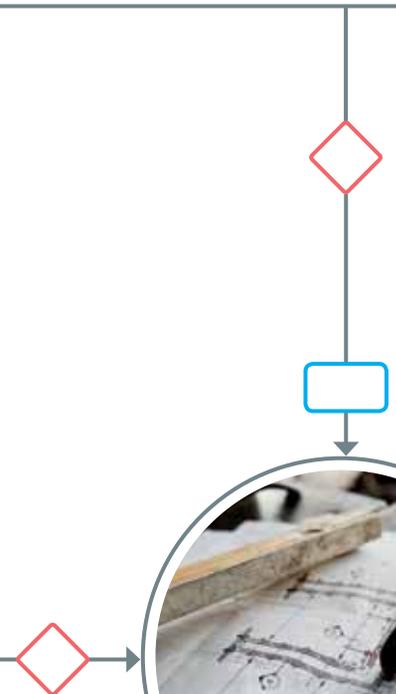
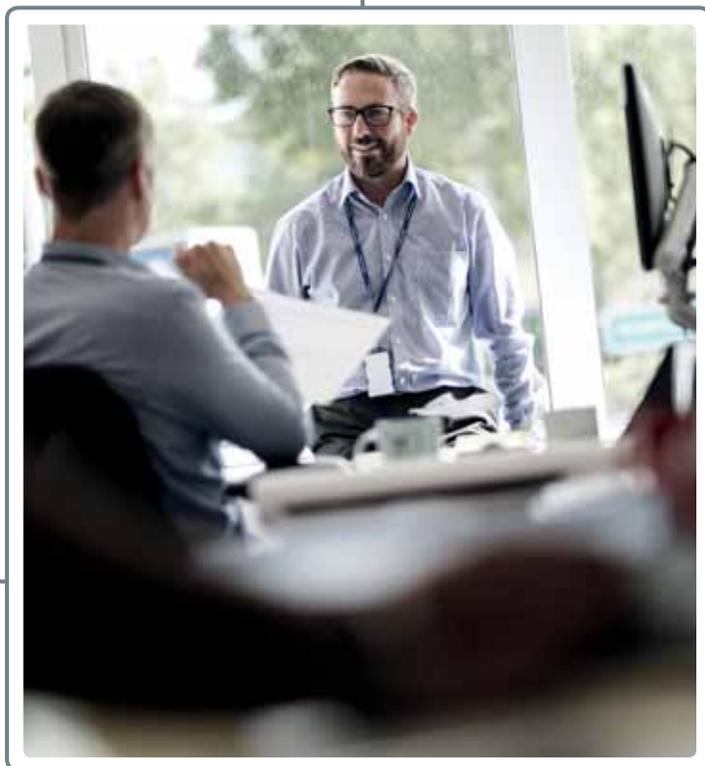
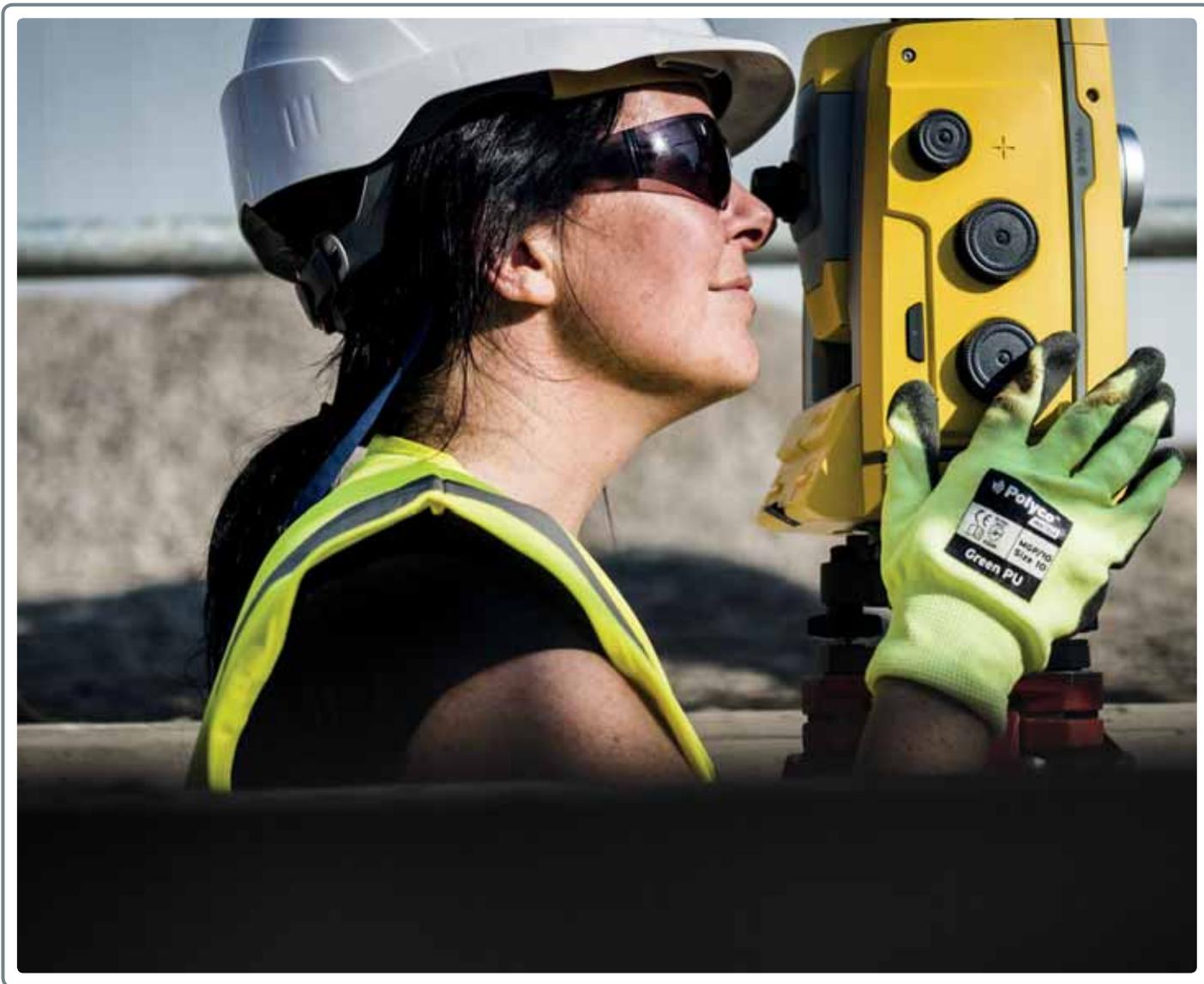


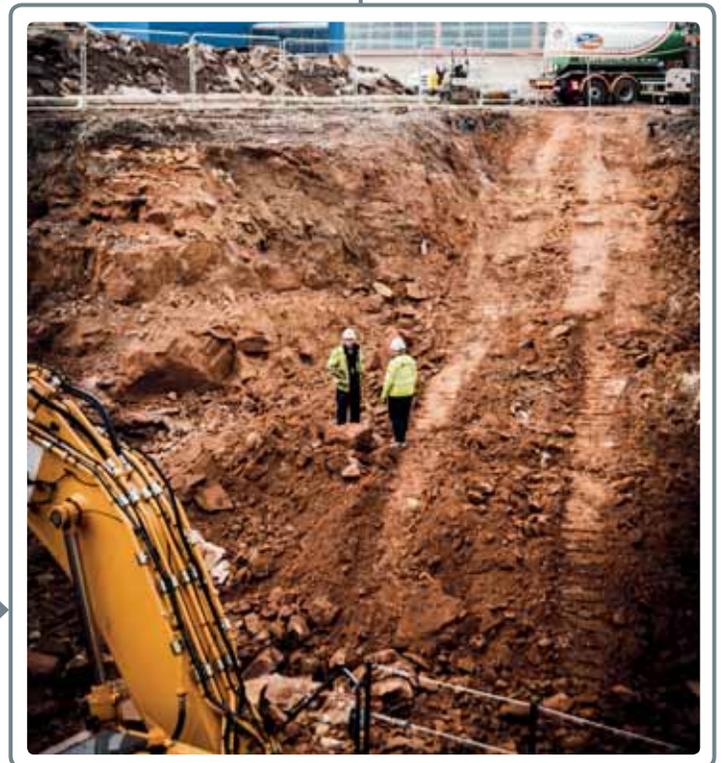


**PLANNING**

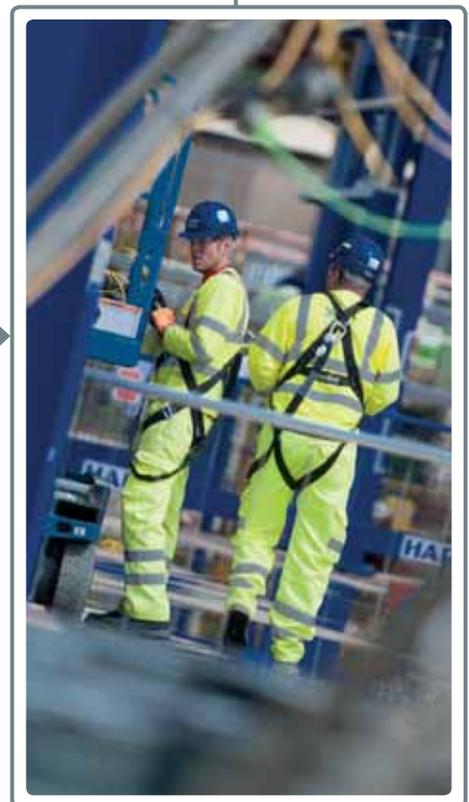
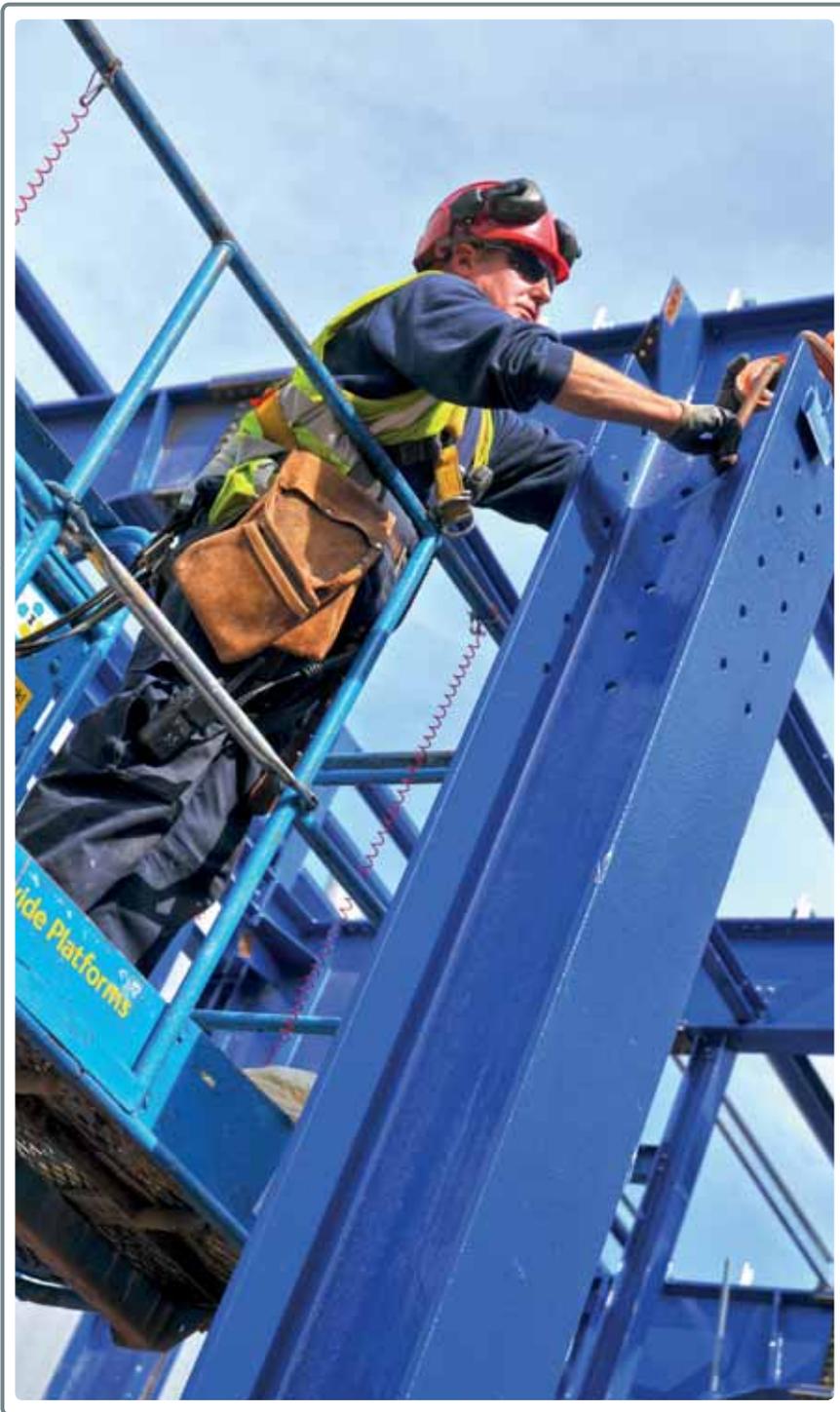
PLANS FOR NEW CONSTRUCTION PROJECTS ARE SUBMITTED TO THE LOCAL AUTHORITIES; COPELAND BOROUGH COUNCIL AND CUMBRIA COUNTY COUNCIL. >>







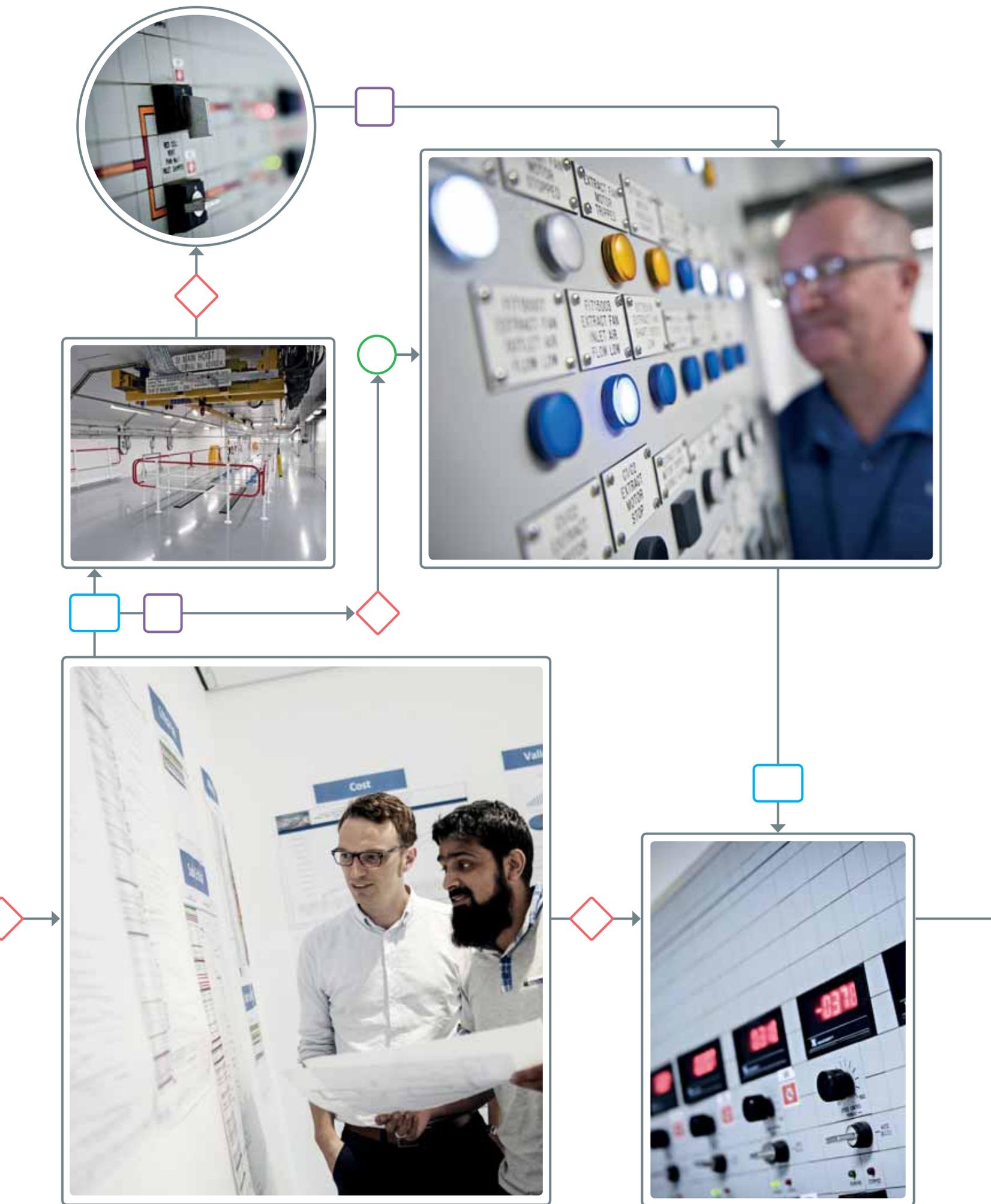
**CONSTRUCTION**  
CONSTRUCTION AT SELLAFIELD IS MADE MORE DIFFICULT BY OUR CONGESTED FOOTPRINT, WITH VERY LITTLE LAND AVAILABLE FOR DEVELOPMENT. >>



### COMMISSIONING

EVERY NEW FACILITY AND PROJECT HAS TO GO THROUGH ACTIVE COMMISSIONING TO TEST AND VERIFY ITS DESIGN OBJECTIVES AND SPECIFICATIONS. >>





**OPERATIONS**

ONCE ACTIVE COMMISSIONING HAS BEEN COMPLETED THE PROJECT CAN THEN BECOME OPERATIONAL. >>





# PROJECT ACADEMY

A new project academy isn't just transforming the way that project professionals who are cleaning up Sellafield can access specialist education, training and qualifications; it is making Cumbria a centre of project excellence for the UK. With the first students already settled into their courses, we went to find out more.

**T**he Project Academy for Sellafield is not only training our next generation of project professionals, but providing accredited training programmes for project managers across the area and across industries. It was a collaborative idea involving many parties, led and nurtured with tenacity by our head of project management, Ian Marr.

"The clean-up of Sellafield relies on the availability of modern processing and storage facilities for nuclear materials, fuels and wastes that we are retrieving from legacy facilities, so we are always looking for ways to improve our project management capability.

"Supporting an academy dedicated to the profession was a logical step for us, but we did not want it to be bespoke to the nuclear industry," explains Marr.

"Project management is the same in our industry as any other. The fundamentals are the same worldwide. We had extensive dialogue with people at the Association of Project Managers and agreed that there is nothing unique about delivering projects in the nuclear environment."

This rationale means the academy can approach issues from a pure project management perspective. Skills learned will be transferable to other jobs, should staff change roles or move on. And, intriguingly, it opens the door to people from outside Sellafield to attend the courses. "Local residents and employees of other companies are able to study alongside Sellafield workers," says Marr.

"A young person seeking to enter the project management world can enrol. It's a fantastic contribution to the local area."

The first cohorts of students through the doors are proving that our staff training with aspiring project managers from other industries is benefiting everyone. Sarah Tyson, one of our project management apprentices and Lori Cockburn who works in operations support for MAP Group UK Ltd, are two of the students currently undergoing training with our Project Academy delivery partner, the University of Cumbria.

Lori said: "It's good to have a mixture of different sectors and experience within the group. We all learn from each other and ideas are always being bounced around. It's also a great opportunity for individuals who are interested in project management to get into employment in Cumbria."

For us, the academy means that our employees across the business can work closely with project managers, learning the language, thinking and principles of project management. At the same time, Sellafield Ltd is the driving force for project management skills on behalf of the UK, having been selected by Government to act as a 'trailblazer' for new apprenticeships. The new project delivery training standards are being produced by employer led groups, known as 'Trailblazers', making the schemes more relevant and therefore more attractive to existing and new employers.

“The course allows me to develop my academic understanding of project management, which in turn will equip me with the knowledge required to have a successful career in project management and further my professional development.”

**Sarah Tyson**



“It’s good to have a mixture of different sectors and experience within the group. We all learn from each other and ideas are always being bounced around. It’s also a great opportunity for individuals who are interested in project management to get into employment in Cumbria.”

**Lori Cockburn**

Candidates on the apprenticeship programme learn on the job across a broad range of project-delivery functional areas, working to gain the full qualification. They are rotated through controls, risk management, construction, commissioning and pre-operations.

Sarah explained that a key driver for choosing this academic course was her longer term career plan. She said: “The course allows me to develop my academic understanding of project management, which in turn will equip me with the knowledge required to have a successful career in project management and further my professional development. Project management is a transferable skill, which is used in everyday life on varying scales.”

Lori agrees, she said: I’ve worked with project managers in the past and I have always been really drawn to it but I felt I’d come to a point in my career where I couldn’t really progress without formal qualifications.

“I’ve been looking for a project management course in Cumbria for a while so when

the FdSc course became available on the University of Cumbria website because of the academy, I applied straight away.”

Sarah and Lori are both completing their courses while working, and both are benefiting from combining formal education with practical experience. Lori said: “I’ve been able to apply a lot of the content I’ve learned to my current role and already learned some new skills. I feel more confident in my role as I have the knowledge and understanding to underpin my experience.”

Sarah added: “My course complements my day-to-day work as it is delivered on a day release basis. As an apprentice we need to learn and gain actual industry experience, this course enables me to develop my academic studies by working towards the foundation degree but also allows me to apply it to experience in a real working environment, the work-based training has also helped me to gain confidence and learn how Sellafield Ltd works as a business.”

It requires a highly complex work programme to construct new buildings and

develop new technology to carefully retrieve this waste, plus the design and build of a fleet of new treatment and storage plants to keep it in. This process has turned Sellafield into the UK’s largest building site.

Our project delivery director, Steve Livingstone, is excited by the opportunities that project management presents for our area and the UK. He said: “There is no reason why the next generation of Sellafield employees, contractors, apprentices, students and school kids of today, cannot take their skills and capabilities out onto the global stage.

“Project management is the same in the nuclear industry as any other. Whether you work on the construction of an airport, a rail network or the Olympic Games, the fundamentals are universally the same. The knowledge, skills and behaviours we apply when delivering projects at Sellafield are transferable to any sector.

The UK is becoming the hub for project professionals, there have never been so many opportunities – so go out and grasp them.” ■

# CALLING ALL INNOVATORS!

**DO YOU HAVE WHAT IT TAKES TO DESIGN AN INNOVATIVE SOLUTION TO ONE OF OUR NUCLEAR CLEAN-UP CHALLENGES? A NEW INNOVATION COMPETITION COULD GIVE YOU THE FUNDS TO MAKE YOUR IDEA A REALITY AND PUT YOUR NAME ON THE GLOBAL NUCLEAR DECOMMISSIONING MAP**

Inspiring innovation and cultivating creativity has been an important part of our story since the very beginning. Whilst our mission may have changed significantly since that point, the quest to foster creative solutions to the challenges we face remains as important as ever.

We're working on a new project with the Nuclear Decommissioning Authority (NDA) and Innovate UK which we hope will further promote innovative problem solving, to support our clean-up mission.

The NDA are taking a proactive role in delivering innovation opportunities, which will enable safer, faster and cheaper nuclear clean-up. As part of this approach the NDA and Innovate UK, the UK government's innovation agency, are funding a £3m remediation challenge which will be posed to the supply chain, with the aim of stimulating creative solutions.

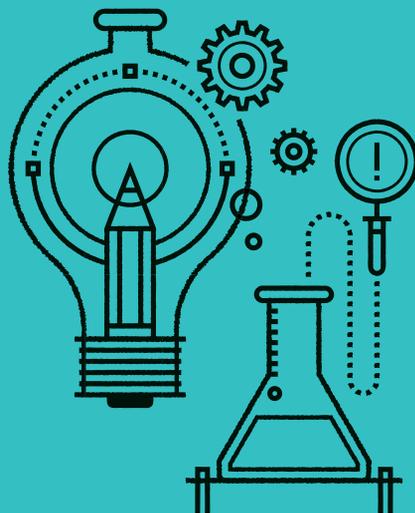
The new competition, which launched at the end of January this year, allows consortia to offer solutions to a real life decommissioning challenge on the Sellafield site – namely the decommissioning of a reprocessing cell containing pipes, vessels and steelwork, to leave an empty, decontaminated civil structure.

The first phase of the competition will allow consortia to produce a proposal and business case for addressing the challenge. Following this, one or two of the consortia will be invited to develop their solution through to a demonstration in an inactive environment.

Melanie Brownridge, the head of technology at the NDA, said: "We recognise

that working together with the supply chain, offering funding to support innovation; we can help speed up the mission at Sellafield.

"This is an exciting opportunity for some of our most creative and innovative companies and individuals to work together to deliver cutting edge solutions to Sellafield's decommissioning challenges."



Chris Hope, who is leading the competition for our organisation, said: "It is very exciting to be able to shape and steer the competition at the outset. We're looking to encourage SMEs and innovators that are new to the nuclear industry as well as those that are more familiar with the Site. We've got a very open mind and want to see the boundaries pushed to enable a real step change."

A further benefit of Sellafield Ltd's involvement in the competition, is the provision of an active facility to test the technological solutions, once inactive demonstration is successfully completed. An area in one of our legacy facilities has already been selected and will be prepared in anticipation.

With interest expected from around the world, the competition opened on 30 January on the Innovate UK website. The next stage will be broker events, designed to bring different creative companies together to develop collaborative integrated solutions.

## LASERSNAKE

This new competition builds on the success of a previous piece of work to deliver an innovate clean-up solution, which saw the creation of the LaserSnake – a clever piece of kit which slithers through an active environment to use lasers to cut through redundant equipment for removal and disposal.

LaserSnake has been winning accolades right across the patch – it most recently won the NDA Supply Chain Technology/ Innovation Implementation Award, which recognises the innovation and collaboration required to take technology or innovation through to successful implementation. The award recognises the hard work of the collaborating partners – OC Robotics, TWI Ltd and ourselves.

**WHERE NOW?**

To find out more about the competition, please visit the Innovate UK website:

**WWW.GOV.UK/INNOVATE-UK**

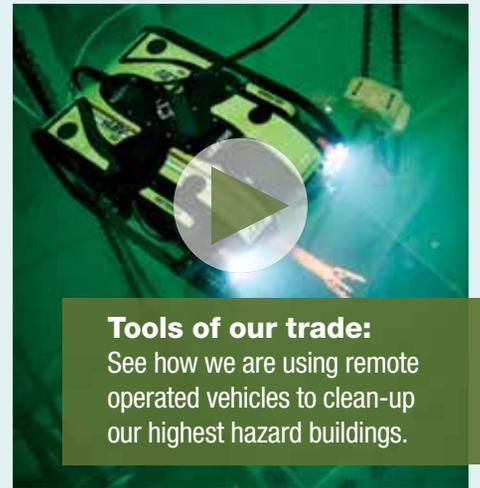
Want to know more?

# Sellafieldmagazine.com

Our online edition of *Sellafield Magazine* is chock-full of top articles and additional content



**Going, going, gone...**  
see the removal of the Windscale  
Pile Chimney filter gallery



**Tools of our trade:**  
See how we are using remote  
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Have your say...

What would you like to see in future  
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[editor@sellafieldmagazine.com](mailto:editor@sellafieldmagazine.com)

For all of this and more, visit [www.sellafieldsites.com](http://www.sellafieldsites.com)

# Introducing the National College for Nuclear

**The nuclear industry and academia are working hand in hand to help provide the nuclear workforce of tomorrow through the creation of a National College for Nuclear. With campuses at Lakes College in Cumbria and Bridgwater in Somerset, the college is gearing up to welcome its first students in Autumn 2017.**

**Locations**  
Lakes College,  
Cumbria  
Bridgwater,  
Somerset



**S**pecialist skills were given a boost last year when the government announced £80 million in funding to support the creation of five new national colleges.

The centres of high-tech training will create the 'workforce of tomorrow' in industries crucial to economic growth – nuclear, high speed rail, onshore oil and gas, digital skills and the creative industries.

With regards to nuclear, the government has established the National College for Nuclear at two locations – Lakes College in Cumbria and Bridgwater in Somerset – and construction has begun on the world class nuclear training centres that are due to open Autumn of 2017.

Supported by ourselves and EDF Energy, alongside the universities of Cumbria and Bristol, the aim is for the college's curriculum and qualifications to match the needs of industry, with employers playing a key role in shaping the strategic direction of the college.

Our human resources director, Colin Reed, is Chair of the Board for the college. He said: "The National College for Nuclear demonstrates the UK's commitment to placing nuclear at the heart of its industrial strategy for the 21st century.

"It will provide the talent required to ensure that the industry can grasp the opportunities offered by this growing and diverse global industry, bringing new revenues and benefits to the wider UK economy.

"New qualifications will be available that reflect the needs of the nuclear sector and address the skills challenge facing the nuclear industry and its supply chain."

"We and the Nuclear Decommissioning Authority are making substantial investments to grow the economy and develop West Cumbria as a global centre of nuclear excellence, and we are delighted that the college will play a big part in the area's development."

Within the nuclear industry, there are significant skills, workforce capability and capacity challenges and opportunities ahead across the 'three civil fleets' – existing, potential and retiring, and the defence industry.

There are few nuclear specific apprenticeships or qualifications and much of the gap is addressed by employers delivering activities such as on the job training.

Paul Goss, head of National College for Nuclear, Southern Hub said: "Although some work has taken place directly by industry, the northern and southern hubs will develop a more coherent skills offer, which will enhance the current system rather than duplicate provision. The availability and quality of academic provision across the UK will be raised, which will improve standards in nuclear professionalism within the industry."

The college will feature virtual reality suites which will allow learners to experience nuclear installations in a virtual environment, science and radiation laboratories and specialised design and modelling suites.

An estimated 7,000 learners will have accessed the college by 2020, and Lakes College Principal Chris Nattress said: "We are looking forward to seeing this superb building being completed. It will play a huge role in the future of nuclear, both here in Cumbria, and on a national scale, and Lakes College is proud to be a part of it."

Vincent de Rivaz CBE, Chief Executive, EDF Energy, said: "EDF Energy is proud to be at the heart of the UK's new National College for Nuclear. The National College will play a vital role in developing skills across the industry, underpinning the UK's nuclear renaissance. The industry needs high quality vocational skills so that we can continue to operate the existing nuclear fleet safely for longer, as well as for taking forward plans for the UK's first new nuclear power station in a generation. The National College for Nuclear will help ensure the UK has the right skills to participate fully in the global nuclear market."

**Find out more at:**

**[www.ncfn.ac.uk](http://www.ncfn.ac.uk)**



**Engagement with employers so far has identified the following curriculum for development by the National College for Nuclear:**

- Foundation Degrees in Nuclear, Civil Engineering and Project Management
- Bachelor of Engineering top-up
- Nuclear Apprenticeship Educational Components
- Nuclear pathway courses
- Generic courses such as nuclear fundamentals and working in a nuclear environment
- Short courses

**Vision:**

**To create world-class nuclear qualifications which employers require and learners aspire to. “National colleges will function on a par with our most prestigious universities, delivering training that matches the best in the world.”**

**National College for Nuclear aim to:**

- Create a world class “higher level vocational pathway” for the UK nuclear industry
- Develop a nuclear curriculum and progression routes into jobs in the nuclear industry
- Meet employers’ needs – including the needs of the defence sector – for nuclear-specific qualifications and other training solutions
- Set standards by accrediting and validating providers and courses
- Support the UK’s nuclear industrial strategy by helping to tackle key skills gaps
- Build a reputation for innovation and outstanding quality, and achieve international recognition for nuclear vocational training ■

# Mina Golshan



## INTERVIEW



BY STEVE BARNES

Deputy chief nuclear inspector for the Office for Nuclear Regulation (ONR) **Mina Golshan** was delighted with the progress that has been made in reducing risks and hazards at Sellafield in the last four years, when she recently visited the site. I sat down with her to find out more.

**H**eading up the regulation of 21 nuclear licensed sites in the UK, including Sellafield, Dounreay and the entire Nuclear Decommissioning Authority (NDA) Estate – comprising over 50 per cent of the UK’s licensed nuclear sites – is a vitally important role in holding the industry to account on behalf of the public.

This task is carried out by Dr Mina Golshan, the Office for Nuclear Regulation’s (ONR) Deputy Chief Nuclear Inspector and Programme Director for Sellafield, Decommissioning, Fuel and Waste.

Mina, who was ONR’s Decommissioning, Fuel and Waste Programme Director before taking up her new, expanded position earlier this year, is in charge of over 80 nuclear inspectors with around 50 responsible for the regulation of Sellafield.

Her role also includes the regulation of a number of fuel manufacture and waste management facilities, taking the lead in nuclear liability regulation and advising the government on waste and decommissioning policy matters.

With a PhD in experimental physics, Mina started her career at the Science and Technology Facilities Council at Daresbury, managing one of the most advanced high-energy X-ray facilities in the UK at the time.

She then moved to nuclear safety and worked for a consultancy company, with Sellafield as one of its major clients before moving to the Health and Safety Executive’s Hazardous Installations Directorate as a risk assessment specialist. Mina then moved to ONR where she became involved in the regulation of the entire decommissioning sector, including key Sellafield facilities such as the Magnox Swarf Storage Silo.

Having last visited Sellafield more than four years ago, Mina says she was delighted with the recent progress made to reduce the hazards and risks from the legacy facilities.

She said: “I’ve been delighted to see major activities at the site, such as completion of bulk fuel removal from the Pile Fuel Storage Pond which resulted in a 70% reduction in its radioactive content.

“Sellafield is a top priority for ONR and this is reflected in the number of dedicated inspectors regulating the site. Our regulatory strategy is focused on accelerating remediation of high risk and hazard legacy facilities including the legacy ponds and silos and the Plutonium Manufacturing Facilities complex, as well as those facilities and processes important for dealing with the arising waste.”

Mina’s Sellafield team is divided into two sub-programmes, one that focuses on routine inspection activities ensuring the site continues to meet its legal requirements ‘without resorting to over-engineering or complex processes’; the other on advising to secure accelerated hazard and risk reduction and engaging with Sellafield’s priority programmes to encourage the safe delivery of projects sooner and more efficiently.

Mina said: “At site, I was most struck by the enthusiasm, optimism and professionalism of the staff I met and the culture of innovation; everyone wanting to do things better and quicker with new, creative whilst compliant ways of working.

“These are exciting times. It is important to maintain the recent standard and momentum and build on these. The key to this is the people at Sellafield and we have seen an outstanding attitude demonstrated in a number of areas. It’s important not to become complacent, forgetting that this is the beginning and there is a long road ahead. What we need to see now is these innovative solutions and these “A-teams” every time and we will be focusing on this over the coming year.

“Key to this progress is having a questioning attitude, open mind, strength in Sellafield’s internal governance processes and internal regulator, and we’ll continue to work with the company to achieve what is a common goal – enhancing the safety on site every day.”

ONR is an independent regulator, but ultimately ‘we are all after the same safety outcomes. We need to build on the recent success through proactively working with others such as the supply chain to promote innovation, which is pivotal to safe, timely and sustainable decommissioning’.

Job satisfaction wise, Mina says she enjoys working with a lot of extremely talented and professional people across the sector ‘who deal with complex issues, tackle challenges and achieve safety outcomes’.

Mina’s passionate about the work of ONR, the challenging but exciting opportunities, especially within the waste and decommissioning sector. Summing up her role, she said: “There is a lot to do and that is both exciting and fulfilling.”

## Mina’s favourite things

### FAVOURITE BOOKS:

**BRAVE NEW WORLD BY ALDOUS HUXLEY AND THE MASTER AND MARGARITA BY MIKHAIL BULGAKOV – I READ THESE AS A TEENAGER AND ADULT**

### FAVOURITE FILM:

**I LIKE SCANDINAVIAN CRIME DRAMAS; RECENTLY ENJOYED GRAND BUDAPEST HOTEL**

### FAVOURITE FOOD/MEAL:

**ALL TYPES OF FOOD, ONE OF THE FAVOURITES BEING SOUTHERN ITALIAN I.E. SIMPLE, FRESH, GOOD PRODUCTS**

### FAVOURITE BAND/MUSIC:

**CLASSICAL MUSIC MAINLY, BUT I ALSO ENJOY PINK FLOYD**

### FAVOURITE HOLIDAY DESTINATION:

**ITALY IN THE SUMMER, AUSTRIA IN THE WINTER**



**COMMUNITY CHOICES**  
DECIDING TOGETHER



We are changing the way that we allocate some of our social impact funding; inviting community groups to apply for funding to help deliver projects that will make a difference in our community then putting the final decision in the hands of the community.

If you're a not-for-profit organisation that's big on giving back, a little really can go a long way. So, the new Community Choices fund is here to help get things moving.

With the support of our partners at Cumbria Community Foundation, CFM, CN Group and Phoenix Enterprise Centre we are proud to launch Community Choices; a scheme where local charities, social enterprises, voluntary and community groups can apply for grants of varying levels to make a real difference in our communities.

## COMMUNITY CHOICES HAS TWO KEY AIMS:

- To give charities, social enterprises, voluntary and community groups a platform to promote to a wider audience the work they are doing to tackle issues within their community.
- For the community to decide which projects they feel will have the biggest positive impact on our communities.

## PROMOTING THE WORK OF YOUR GOOD CAUSE

We are very fortunate that there are many groups working hard to improve our quality of life within Copeland and Allerdale. We want to help you let everyone know about your work and the benefits it brings to the community.

For the shortlisted finalists, Community Choices is designed to be the platform which gives you an online presence, supported by a print and radio media campaign, to raise awareness of the work that you are doing and show everyone how you are making a positive impact within our community.

To ensure that as many groups as possible have a chance of being shortlisted, there are a number of different grant categories to submit your project against.

## ADDRESSING ISSUES WHICH MATTER TO YOU

Once an independent panel has chosen the shortlisted finalists in each category, the power to decide which projects receive grant funding is in the hands of the local community.

Community Choices gives everyone the chance to vote up to 10 times for the projects which you feel best addresses the issues within your community. You can use all ten of your votes on a single project you feel passionately about or you can spread your votes over multiple projects in different categories. The choice really is yours. Those projects with the most votes will secure a grant.

**VOTING IS OPEN FROM  
27 FEBRUARY TO 26 MARCH**  
[www.decidingtogether.org](http://www.decidingtogether.org)



# PHOENIX

## FROM THE

# FLAMES

Watching the team of specialists at TSP Engineering tackle the refurbishment of packages and shielded doors for one of the highest hazard facilities in the country, it is difficult to imagine that only a few years ago the business faced a very uncertain future. As we stand on the verge of our own transformation, we look at how TSP Engineering has become a profitable arm of British Steel.





**TSP Engineering have won a four-year, multimillion pound contract to modify and refurbish a fleet of high-integrity shielded containers and doors that will facilitate the safe transfer of waste from one of our legacy silos, the Magnox Swarf Storage Silo, to purpose built storage.**

The project will enable the decommissioning of the historic silo which is one of the most hazardous facilities in the country and the collaborative way that TSP Engineering is delivering the work has been recognised by an award from the Nuclear Decommissioning Authority.

It is difficult to imagine that as recently as 2014 the company was facing an uncertain future. Its previous owners, Tata Steel, announced it was in talks to sell the Workington plant, a decision which would leave the company in limbo for 18 months.

Now owned by the private equity firm, Greybull Capital – who also revived the British Steel name – the firm is going from strength to strength.

John Coughlan, Director of Operations, said: “It was a difficult time for us. When you are put up for sale it is very difficult to win

work and that had a knock on effect to our local supply chain.

“Transformation is never easy but I am immensely proud of our workforce and the way that they have continued to deliver the best possible products and services for our customers.

“We don’t make steel, the majority of our work is servicing nuclear, defence and industrial sectors, but we are proud to be

**“Growth and diversity isn’t just good business sense for us, it is also the best thing for the area – there is no reason why our team in Workington can’t help to tackle engineering challenges across the country and beyond.”**

part of the reinvigorated British Steel brand. Having a stable home for our business means that we are continuing to compete for and win work, securing a future for our workforce and supply chain.

“In the first 100 days of being an independent company we hit all of our performance targets and have returned the business to profitability. I really believe that we are now better placed to capitalise on our strong heritage, vastly experienced and skilled workforce and world-class products.”

With a separate and focused TSP Engineering management team and the goal of becoming a standalone independent subsidiary of the British Steel business in early 2017, TSP Engineering has remained in profit in recent months and is on course to generate further profits in this financial year.

Working on the Sellafield mission is a key step in their journey but is not the limit of their ambitions. “Sellafield is the most iconic nuclear facility in the world and to knowing that we, as a local business, are helping to clean up the site is something that we take a real pride in,” Gareth Monkhouse, proposals manager, said, “but we also have our sights set on customers across different industries. Growth and diversity isn’t

just good business sense for us, it is also the best thing for the area – there is no reason why our team in Workington can’t help to tackle engineering challenges across the country and beyond.”

Their commitment to delivering high quality products and services was recognised last year when we awarded the company with the reputable supplier certificate of approval for its commitment to quality and technical standards.

Mike Ames, technical manager, said:



## TSP Engineering

**TSP Engineering is a manufacturer of high integrity, often bespoke plant and equipment.**

**Number of Employees: 213 including Number of Apprentices: 15**

Spent £3 million of training and Development

Founder Member of Gen II

### TSP Engineering:

Curwen Road, Derwent Howe, Workington, Cumbria, CA14 3YX

Tel: 01900 68000

[www.tsp-engineering.co.uk](http://www.tsp-engineering.co.uk)

### Accolades:

#### Winners:

- CN Business Awards 2016 Exemplar for Excellence in Cumbrian Manufacturing
- UK Manufacturing Champions 2016 – John Coughlan, Manufacturing Leader of the Year and Hannah Ridley, Rising Star
- RoSPA Silver Award 2016
- UK Chamber of Commerce 2016 – Commitment to People NW Region
- BECBC Awards 2016 – Highly Commended for Inspiring People

#### Shortlisted:

- BECBC Awards 2016 – Excellence in Health and Safety
- UK Chamber of Commerce 2016 – Commitment to People National Award
- NDA Supply Chain Awards 2016 – Best Supply Chain Collaboration

“Sellafield Ltd carried out an intensive deep dive assessment that involved assessing the quality management system and working practices against stringent contract quality requirements and technical specifications at our Workington facility. The achievement confirms our outstanding level of quality along with having the technical expertise to deliver the high-integrity products to Sellafield Ltd’s requirements.”

This view was endorsed by our head of supply chain quality, Martin George, who said: “TSP Engineering has demonstrated the highest level of commitment by any supplier as part of the certification process. I’m very impressed with this level of commitment and enthusiasm for the TSP Engineering management and shop floor workers, well done to all.”

Core to TSP Engineering’s business typically is their expertise in design, project management, manufacturing, testing and commissioning to an exacting and exceptional quality standard. Their Workington facility includes 19,200 square metres of shop floor capacity, manufacturing and

testing pits with a maximum lifting capability of 130 tonnes.

John is proud of the facilities that TSP Engineering can offer its customers but believes that the team are just as much of an asset. He said: “Our physical assets are supported by a team of highly skilled personnel within the areas of machining, fabrication, shot blasting and painting, heat treatment, assembly and testing.

“We are part of the Civil Nuclear Sharing in Growth programme and have invested in excess of £3 million on training and development of our people in understanding the supply chain requirements for supplying nuclear new build and decommissioning projects.

“We are also working with our supply chain and operating as a conduit business for the dependant small to medium sized enterprise community, helping them to access higher value work and revenue streams from Sellafield Ltd that they don’t have the capability to compete for on their own.”

This approach was recognised by the Nuclear Decommissioning Authority who shortlisted TSP Engineering for their Best Supply Chain Collaboration award at their annual estate wide supply chain awards in 2016. ■



# Leading on the legacy

**Our latest executive recruit brings a fresh perspective and new energy to decommissioning the legacy storage facilities. John Oliver's colourful past in the oil and gas industry will help us hit the right notes in hazard and risk reduction.**

**E**ven though we have a large and diverse workforce, we think we can say with some confidence that John Oliver is the first ever employee who has joined the company with a back story which includes singing at the Opera House in the capital of Kazakhstan and checking his work boots for snakes in the morning.

John is our new waste retrievals director, and therefore responsible for removing the hazardous waste from our four legacy storage facilities – which is our highest priority mission.

His colourful background comes from a 30-year career mainly spent in the energy sector, where he has delivered a diverse range of major projects around the world, including building a gas processing facility in a mountainous Bolivian jungle (hence checking his boots for snakes), and most recently expanding a super-giant gas field in Kazakhstan (he found time to entertain the locals in the opera house as a bass singer in a choir).

Other notches in his professional belt include building the rail and transport links into Heathrow Terminal 5 and ongoing work as Visiting Professor at Loughborough University's School of Civil and Building Engineering. It amounts to a rich tapestry of managing complex and often hazardous operations which will stand him in good stead when leading the mission to decommission the 'big four' legacy facilities.

"There are lots of similarities between my new job and work I've done before," says John. "The environmental sensitivities and importance of managing risk are just as important if you're dealing with toxic chemicals such as hydrogen sulphide gas or radioactive material. You need a structured, disciplined and safety-led approach. When you're working next to a delicate ecosystem like the Caspian Sea, the stakes are just as high and the interest from regulators, Governments and pressure groups is just as great."

As the person directly responsible for delivering these major projects, he was often the man that the politicians and regulators wanted to speak to for confidence and assurance that the nuts and bolts of a programme had been properly thought through. "Often they didn't want to talk to the money men or people varnishing the 'message' – they wanted to speak to the guy who was putting the spade in the ground... and that was me."

In reality the 'spade' was usually held by a contractor and John has widespread experience of working with supply chain partners as the 'intelligent client' who was ultimately responsible for how billions of pounds of his company's money were spent. "It's a partnership where both sides work to help the other be successful. I believe in a fair day's pay for a fair day's work but it's not success at any price. At Sellafield, we need to help our good contractors bring us the

“At Sellafield, we need to help our good contractors bring us the solutions we need and help them get on with delivering the work.”

solutions we need and help them get on with delivering the work. We also need to encourage new suppliers who don't currently work with us but have the skills, innovation and technologies we need to deliver the mission.”

John recognises the progress that has been made by the decommissioning programmes and his predecessor Scott Reeder, who is returning to the US to continue his nuclear work with AECOM. “We are seeing significant and visible progress in hazard reduction. My job is to ensure the teams have the ‘air cover’ so they can carry on with removing the risk as quickly as humanly possible.

“Some of the world's best nuclear experts are right here on the site. I'm not here for my nuclear knowledge, but I can help with the governance of the programmes so that everyone understands what we're doing. If I can make sure we have the right resources, the right support and the best way of working then we can safely speed up the rate of progress,” said John.

He takes inspiration from the Japanese ‘plan long, build quick’ approach to making projects happen and describes his management style as collaborative. “I work with people and teams to get the best out of all the brains in the room. You need to get buy-in, but once we've decided what we're doing then I will push hard to make the things we've agreed happen. Once it's time for delivery then you shouldn't get side-tracked or start debating again. Be aware of the risks, keep safe, but go for it.”

Born in Northumberland and still retaining a good hint of Geordie in his accent despite years of being based in London or abroad, John has two daughters who are currently finishing their degrees, and is looking forward to properly dropping anchor in Cumbria so he can explore the local fells with his wife Corrie and their two springer spaniels.

Before joining us, he had visited the Sellafield site before to see progress on the early days of Thorp in 1992. “When I was told Thorp would soon stop reprocessing and parts of it will be decommissioned I thought ‘hang about, I can remember standing in the viewing gallery when it was just starting!’ I think the main shock was the realisation I've been around for that long.”

Given the uncertainties of the waste retrievals mission, it won't be John's last surprise on the Sellafield site. But he's looking forward to the journey. ■

# A simple solution saves pounds.

An **idea** familiar to those who store bedding and clothing under the bed is saving thousands of pounds in waste disposal costs for asbestos contaminated materials



**S**ometimes an idea is so simple, you can be forgiven for thinking that it couldn't possibly work. In this case, our asbestos management team have used technology familiar to many of us at home, to deliver huge cost and volume savings on the disposal of asbestos soft waste – ie, items like asbestos suits.

Suits are stored for disposal in 200 litre drums. Under the previous disposal process, four suits were disposed of per bag, and one drum could store three bags. In comparison, vacuum packing reduces the size, which allows for 40 suits to be

stored per vacuum bag, and three of these can be stored in a drum. This increases storage by a factor of 10 – 120 suits compared to the original 12.

Mark Ferguson, asbestos team manager, said: "We're really proud of this simple but effective solution, which helps us better manage asbestos waste.

"Advantages of the new system also include the reduced disposal costs – the vacuum bags are cost neutral due to the reduction in other bags required, and the negative pressure of the bags after they have been vacuum packed means they are

a safer option, as in the event of puncture, air would be sucked into the bags, rather than released from them."

The process does not require additional materials or hardware, using a vacuum cleaner that would already be required for asbestos work, and it is compliant with the CAR 2012 Asbestos Regulations.

Simple solutions like this are as important to the delivery of the Sellafield mission as technological innovation and new inventions, and ensure we're doing our work in a fit for purpose, cost-effective way.

**How do we make sure that boxes of intermediate level waste retrieved from our legacy buildings are stacked with absolute precision? The answer lies behind the thick concrete walls of a new waste store that is taking shape at Sellafield.**



# MISSION POSSIBLE

**O**ur ability to clean-up our most hazardous buildings at Sellafield, the legacy ponds and silos, relies on our ability to process and store the nuclear waste, fuel and sludge that has to be retrieved from those redundant buildings.

Part of that challenge is what we do with intermediate level waste. This category of waste includes materials like the outer casing of nuclear fuel and contaminated equipment and machinery. Ultimately the waste is likely to be stored in a geological disposal facility,

but in the meantime we are constructing a new storage facility at Sellafield.

The Box Encapsulation Plant Product Store and Direct Import Facility will ultimately receive and store 6,681 boxes of waste – received at a rate of nine per day – stacked nine high across the vast floor of the highly engineered store. Ensuring the accuracy of this stacking operation is in the job of the store’s special feature; and optical recognition system.

The first box in each stack will be placed

on the floor so that four corners touch special plates that have been installed across the building’s two storage areas. Corresponding targets on the roof pinpoint the exact centre of that box so that when the remotely operated overhead crane stacks the next box on top, it is guaranteed to be in the right position.

Full installation of the store’s equipment is due to be completed in April this year with final testing of the overhead cranes due to start in June. ■

**A seemingly-simple change to the way we manage construction 'waste' is saving Sellafield thousands of pounds as well improving our environmental credentials.**

# Spoil

**We all know the importance of avoiding the unnecessary disposal of waste, and for any business, the cost implications of this can be huge.**

Close work between our waste management and construction teams has delivered a creative, fit for purpose way of managing the spoil we create on the Sellafield site, and one that is saving the taxpayer hundreds of thousands of pounds a year.

This means that rather than disposing spoil to off-site locations like landfill and then purchasing new aggregates for projects, we can now store this material at Sellafield for future reuse, bringing countless environmental, financial and socio-economic benefits.

Environmentally, we're following the waste management hierarchy, and are reusing our waste rather than disposing of it unnecessarily.

Financially, we avoid the double costs of disposal of the material

and then the later purchase of similar materials for construction projects – and these costs can be striking. Disposal costs can be in the region of £45/m<sup>3</sup> and new aggregate can be a further £5/m<sup>3</sup>.

This is an issue that became more pressing as the cost of disposal and purchasing materials increased significantly over time.

The move will also significantly reduce the number of lorries on the road transporting materials to and from Sellafield. This is an important part of our commitment to being a good neighbour and minimising the impact of our operations on the communities in which we operate.

Dan Fielden, waste project lead, said: "Since we've started this work, we've already diverted tens of thousands of m<sup>3</sup> of spoil for on-site storage and reuse. On one project alone, this has saved more than £250,000. So this new approach really does make sense – and that's before you even consider the wider environmental and socio-economic benefits."

"The implementation has taken some time – as we needed

to ensure our regulators were satisfied, ensure the procedures worked, and that stakeholders were supportive."

This included ensuring that we met the Contaminated Land: Applications in Real Environments code of practice, which exists to determine whether excavated materials need to be classified as waste or can be reused.

This new way of working has been piloted on the new Silo Maintenance Facility, and will be continued on the majority of future construction projects.

Maria Pennington, construction manager for the new facility, said: "When we started work on this project, we were keen to look for the best solutions to the challenges we faced. We recognised that reusing spoil would be an efficient way of working – avoiding unnecessary cost. In fact this work was a bit of a lightbulb moment – we realised that if we could reuse spoil as part of this project, then there were numerous other places on the site where we could do the same." ■



## PHOTOGRAPHER *in residence*

The assignment was to get a shot of Calder Hall. We drove over and found this great spot overlooking the whole site. Just as I was about to step out of the car when the heavens opened and dumped what felt like a year's rain on the car. I threw my gear and myself back in the car and looked out of the windows. And then there it was. THE shot, not the one I was asked to shoot, but the one I knew I wanted to use for this page if given the opportunity. I love this. To me it tells all about that moment in the car. And that is what photography should be all about.

Moments captured.

**Thomas Skovsende**



# A stellar apprentice



It is well known that apprenticeships offer young people the opportunity to ‘earn while they learn’, combining classroom learning with vocational training. Having completed a two year business administration apprenticeship at Sellafield, **Jason Savage** explains how apprenticeships offer so much more.

**G**etting ready to attend the final close out of my apprenticeship at the official certificate presentation ceremony, I was struck by how much my life – personal and professional – has changed over the last two years.

My first day with Sellafield Ltd as a business administration apprentice was not without incident. As I was writing this article I was asked to consider what advice I would give to other people considering an apprenticeship. My answer is this: don't forget to check what you are supposed to take with you on your first day. My joining instructions said that I needed to bring three forms of identification with me on the first day. How many did I take? None. Not even my driving licence. Not the most auspicious start to my professional life.

Despite the less than stellar first day, the rest of the two year programme has been a great experience and the time has flown by. Yes I have spent time in college and yes I have received on the job training. But I have also shadowed my local member of parliament, promoted apprenticeships in schools and on the radio, and I have chaired the company apprentice council. I have helped to raise



“The tall ship challenge gave me skills, friendships and an experience that I will never forget.”

money for charity, I have participated in meetings with the leaders of my organisation who have been genuinely interested in what I had to say, and I have promoted National Apprentice Week.

I also spent a week working with nineteen other apprentices on a tall ship that sailed from Wales to Ireland. We ran the ship helping with cooking, cleaning, watches and general ship duties. It was a week that gave me skills, friendship and an experience that I will never forget.

The opportunities that I have had over the last two years are proof that the company is committed to apprenticeships.

That leads me nicely to my second top tip for people considering an apprenticeship: grab every opportunity with both hands. Say yes to everything, work hard and you will develop your skills and your confidence.

At today's certification presentation we were welcomed by our Chairman, Tony Fountain, and the MP for Copeland, Jamie Reed. Listening to their stories and experience was inspiring. Jamie talked about West Cumbria becoming one of the fastest growing economies in the UK in the coming years, there isn't a better time than now to start a career in the area and I feel the best way to do this is through an apprenticeship.

I was presented with the 'Contribution to the Community' award for my work as joint-chair of the apprentice council and for my work with various charities and social enterprises. It was an incredible end to a life changing experience.

I have already started my permanent role with the company as part of the Social Impact team. I spent the final year of my apprenticeship with the team and to get to continue my professional career with them, helping to drive positive social outcomes from the Sellafield mission, is really exciting.

My final tips for anyone considering an apprenticeship as their route to employment are:

- Find the positive in every situation: I once challenged a senior manager who was asking for a key to an office. When I asked the then Head of Technical for Decommissioning, Rebecca Weston, if she was allowed in, she politely informed me that it was her office. Not a conventional ice breaker, but over the two years I have developed a really good working relationship with Rebecca and even recently completed a charity military challenge with her.
- Just go for it. At least apply and have the option available. If you are like me and didn't want to go to university it's an amazing chance to further your education as well as learning from the job. Now I am out the other end I can fully appreciate how great it actually was. Don't hold back. Take control of your future, and don't forget your identification on day one.

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2016

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# EXCELLENCE AWARDS AND MORE...

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The end of the year is often a time of reflection, an opportunity to celebrate your successes and to set out what you hope to achieve in the year ahead.

Towards the end of 2016 we did just that, celebrating our achievements and the people that made them possible.

We watched with pride as our teams and supply chain partners were victorious at our Excellence Awards and Pride Awards.

We also recognised the talent in the next generation at our annual Apprentice, Trainee and Graduate of the Year Awards.

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DATE:  
**12 October 2016**

LOCATION:  
**Energus**



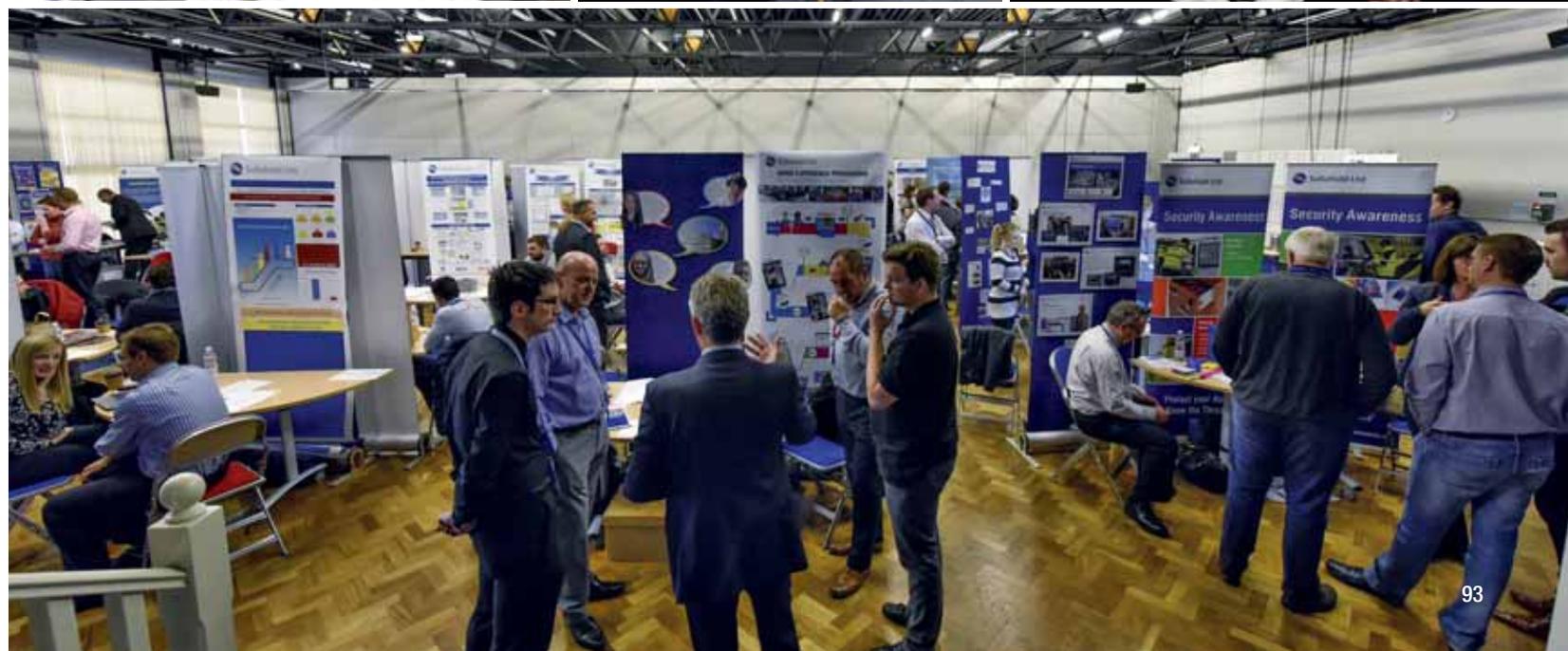
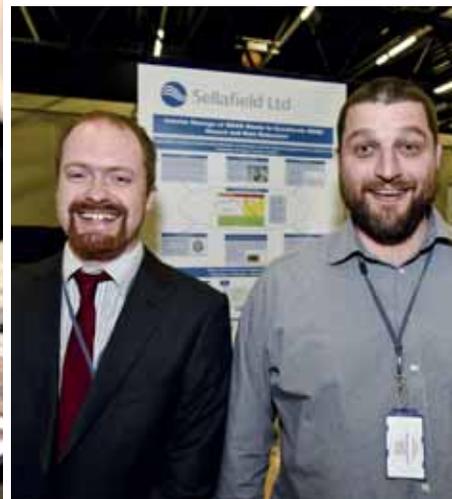


DATE:  
**2 November 2016**  
LOCATION:  
**Risley**



DATE:  
20 October 2016

LOCATION:  
Sellafield training facility



# AND THE WINNERS WERE...

Excellence awards winners 2016

## SAFE, SECURE, SITE STEWARDSHIP



### Performance Improvement

Simplifying processes and building strong capability and support has improved learning between areas, prioritising efforts to where it is most needed.



### Electrical distribution standards

Challenging the norms and working collaboratively with supply chain partners, teams were able to study the potential for using commercial off the shelf equipment which is fit for purpose without compromising on quality, resulting in cost savings of up to 55% on installing a new substation.



### Repairs to splitter wall

Repairs were carried out to a wall in an underground duct using a polyuria membrane. The solution was completed in challenging conditions nine months ahead of schedule. The team also scooped the Chief Executive Officer's award.

## DEMONSTRABLE PROGRESS



### Start of bulk sludge retrievals

The first transfer of sludge from the First Generation Magnox Storage Pond to the Sludge Packaging Plant in late March 2016 was a benchmark moment in UK nuclear decommissioning history. The team behind this significant achievement involved our teams and supply chain specialists and overcame years of technical challenges to deliver the installation, inactive and active commissioning of the first set of pond sludge retrieval equipment.



### Encapsulation of 100% skip cleaning debris in Magnox Encapsulation Plant

Operations, projects, technical and design groups working with drum manufacturer, Radioactive Waste Management and the National Nuclear Laboratory delivered an optimised design of drum to encapsulate skip cleaning debris at the Magnox Encapsulation Plant.



### Downreay Exotics Fuel Programme

Downreay Exotic Fuels forms part of a national consolidation programme to relocate nuclear material to Sellafield to achieve highest levels of safe and secure storage as well as lifecycle cost savings across the Nuclear Decommissioning Authority estate.



### Fit for purpose Interim Storage Facility for the First Generation Magnox Storage Pond Self Shielded Boxes

The new Interim Storage Facility will house self-shielded boxes containing zeolite skips from the First Generation Magnox Storage Pond for up to 50 years. The combination of the new facility and the use of self-shielded boxes provides an opportunity for the early retrieval of zeolite skips from the legacy pond.

## RETURNS ON INVESTMENT



### Master Slave Manipulator/Remote Handling Forum

This group developed Master Slave Manipulator Training (remote robotic arms) that is recognised as best practice and have also been working with users, industry peers and suppliers to transfer major equipment items identified for disposal back into service making substantial savings.



### Infrastructure Strategic Alliance

As part of the Infrastructure Strategic Alliance's socio-economic contributions into West Cumbria, Morgan Sindall and Arup, in partnership with Copeland Borough Council, have been running a scheme called 'Creating Careers in Cumbria'. The scheme selects candidates from within the boroughs of Copeland and Allerdale who are unemployed, to provide work experience and training that aims to increase their prospects of future employment. To date 72 individuals have been through the scheme and over 80% of these candidates have gone on to find employment.



### Category management – standardise, simplify and organise

Category management is a common sense approach to buying in engineering solutions and involves experts from our teams talking through their needs direct with the supply chain. The approach looks to standardise equipment across plants, rather than specifying something new for each project being developed.

## G6 AWARD



### Pile Fuel Cladding Silo 'family' Includes:

#### Early retrievals, de-centralised control system

The Pile Fuel Cladding Silo early retrievals project was tasked with reducing the cost and complexity of the retrievals plant control system. The resultant de-centralised control system saved 10,000 man hours of project effort and saved a minimum of £2.5m whilst also making the system less complex and easier to install.

#### Reduced retrievals containment size

The silo early retrievals project team used the fit-for-purpose and lead and learn philosophies to redesign the retrievals Modular Containment Room. The room was vastly reduced in size and complexity leading to saving of £40m in projected costs and enabling the start of retrievals date to be brought forward from 2022 to 2019.

#### Waste container consumable import box

The silo early retrievals project requires consumables to be imported into its retrievals process. The team designed an innovative cardboard import box system which both reduced cost by 87% and the time needed to manufacture and install when compared to stainless steel.

## WASTE EXCELLENCE



### Interim storage of Magnox Swarf Storage Silo waste to accelerate hazard and risk reduction

A simpler approach to the retrieval and processing of waste from one of our legacy silos has been identified, leading to changing the national strategy for management of this waste to passive interim waste storage. The simplified process enables accelerated risk and hazard reduction and saves several years off the retrievals schedule.

## PEOPLES' CHOICE

### LaserSnake2 active demonstration

Using laser cutting technology, a snake-like robotic arm can be deployed to work remotely in complex and hazardous environments. Its development is part of a lead-and-learn approach to deliver site clean-up and decommissioning.



### Special thanks to our Excellence Awards sponsors:

Gold sponsors: National Nuclear Laboratory, Balfour Beatty and PricewaterhouseCoopers

Silver sponsors: Jacobs, James Fisher Nuclear, WF Senate and ADAPT

# Achieving triumph over adversity

**Falklands War veteran Simon Weston CBE was our guest of honour at this year's excellence events and spoke passionately about overcoming challenges and accepting change.**



In their ninth year, these events are an opportunity to celebrate our employees and supply chain colleagues; to recognise and acknowledge their commitment to making a difference, challenging the norm, using innovation and collaboration to safely deliver on all aspects of our mission.

The theme this year was "Delivering excellence through change". With reprocessing set to end by 2020, we're embarking on the biggest change in a generation. Increasing focus will be placed on decommissioning and environmental restoration activities on site.

The guest speaker, Simon Weston, spoke about what it takes to triumph over adversity. His message was one of single-minded determination, to not only accept what is, but to turn that to your advantage.

Simon was a Welsh Guardsman on board HMS Sir Galahad when it was bombed in June 1982 during the Falklands War. He suffered severe burn injuries to 46 percent of his body, and endured many years of reconstructive surgery and numerous operations.

"People say I was unlucky. I feel lucky, I came back alive. Forty-eight

people who were with me on that day would have taken my luck."

His injuries were so severe that when he was wheeled into the transit hospital at RAF Lyneham he passed his mother in the corridor and she didn't recognise him:

"My first encounter with a really low point was when they wheeled me into the transit hospital at RAF Lyneham and I passed my mother in the corridor and she said to my gran, "Oh mam, look at that poor boy" and I cried out "Mam, it's me!" As she recognised my voice her face turned to stone."

Simon emphasised how important it is to invest in yourself and believe that you can make a difference.

"It's not about what you have in life – it's about what you're prepared to do with it. I accepted change in the most drastic fashion. I had to reinvent myself. The skill in life is to identify opportunities; invest in yourself and believe you can make a difference. You're the best investment you've got."

Simon has made a difference to so many people's lives and continues to inspire others. Following his injuries and more than 70 operations, Simon's road to recovery saw him achieve a number of highly successful ventures including 'Weston Spirit', a Liverpool-

based young people's charity.

Attendees found his talk inspiring: "In my eight years here that was the best talk I have had the pleasure of listening to. Hugely interesting, motivational and thought-provoking; it was a privilege to listen to Simon Weston and I took away a lot about how to perceive change."

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The skill in life is to identify opportunities; invest in yourself and believe you can make a difference. You're the best investment you've got.

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## Learn live

Via a live web feed, Simon addressed around 1,000 pupils from nine schools across the north west including four Cumbrian schools; Whitehaven Academy, St Benedict's, Energy Coast UTC and Furness Academy.

He went on to tell them they could achieve anything they set their minds on if they work hard enough. He talked about his past, from his early days when he fell into the wrong crowd, his emergence as a talented rugby player, his time in the army and

his well-documented experience of overcoming his injuries from the Falklands War and the effects this had on him and his family.

He said: "I have to work harder at 55 than I ever thought I would be as I didn't invest in myself at school.

"Don't let anyone shatter your dreams or stop you believing that you can achieve anything you want."



See Simon speak to school pupils across the north west – [www.sellafielddmagazine.com](http://www.sellafielddmagazine.com)

# Apprentice, Trainee and Graduate of the Year Awards

It has been an exceptional year for our apprenticeship programmes. We take great pride in seeing our people develop their skills and strive to be the best at what they do. More than 100 young nuclear professionals have recently graduated in a broad range of professions, reflecting the diverse skills required to complete our site's mission.

The apprentice awards recognise and celebrate our talented apprentices. These individuals have completed foundation training with Gen2 and have started their apprenticeships with us. These individuals have shown continuous achievement throughout their training programmes:

The PROSPECT Achievement Trophy winner:	<b>Jack Riley</b>
The UNITE Union Cup winner:	<b>Hope Cairns</b>
The Windscale Cup winner:	<b>Adam Sharp</b>
The Len Pearce Trophy winner:	<b>Luke Surry</b>
The HG Davey cup winner:	<b>Jonathon Patton</b>
GMB Union Nuclear Worker Apprentice Cup winner:	<b>Jessica Parkinson</b>
Advanced Apprenticeship in Design winner:	<b>Adam Sharp</b>
Trainee of the year winner:	<b>Dean Petre</b>
Graduate of the year winner:	<b>Bradley Tait</b>



## AWARDS EVENING

# PRIDE OF SELLAFIELD LTD

Tributes were paid at the awards evening to the 'Pride of Sellafield Ltd' – an inspirational group of people who went above and beyond their normal duties to help an individual, group or community in need.

**A**s **Louise Bell** was driving home one evening she noticed a man lying on the road side. She stopped, summoned the emergency services and stayed with the gentleman until help arrived. Using her skills as a nurse, she obtained a detailed history from the casualty which she gave to the ambulance crew when they arrived. She then set off again for home.

Further into her journey she came across a car that had been driven onto a roundabout. Expecting the driver to have left the scene, she parked her car, called the police, and then went to check the vehicle.

She found an unresponsive driver at the steering wheel. She provided first aid and opened his airway using a technique to prevent further spine injury. Once the gentleman was talking she gained as much medical history and details of his injuries to give to the ambulance crew on their arrival.

During her long and eventful journey home Louise drew on her knowledge and skills to preserve the health of both individuals going out of her way under difficult and intimidating circumstances.

**Stewart Ottley** was on his way to work when came across a car stranded in flood water near Duddon Bridge. He quickly got out of his car, pulled on his waders, and made his way through waist-height water to save an elderly man trapped in the vehicle.

After battling against the pressure of the water, he finally managed to free the man and lead him back to his car before driving him home.

A firefighter who was at the scene, praised his efforts also urging members of the public to be cautious in situations such as these. Stewart's recognition of the danger posed by the rising flood water, coupled with his actions, helped save this man's life.

The winners of Emergency Services Extraordinaire Awards **Mike Gullen** and **Angela McGrady** provided exceptional support following Storm Desmond and the floods in December 2015: Mike through his actions as part of the Wasdale Mountain Rescue Team and Angela by helping coordinate county-wide emergency support as a briefing officer to a Strategic Coordination Group at Cumbria Police headquarters.

Mike, deputy leader of Wasdale Mountain

Rescue Team, was taking part in a fast water technical training course when a real incident occurred nearby. He and others responded when a kayaker got into difficulties and would probably have drowned if rapid intervention and expert help had not been so readily available.

The kayaker, having come out of his boat, managed to grab a branch holding his shoulders and head above the water. His foot was trapped between a branch under water He couldn't have held on for long with the sheer amount and velocity of the water.

The team on the bank moved quickly to free the kayaker's trapped foot enabling him to climb onto the top of the branch.

Mike plays an active and leading role throughout the flooding that occurred in Cumbria following Storm Desmond, December 2015. There was further flooding in the North of Britain on Boxing Day 2015. A mountain rescue group from around the county, led by Mike, first went to Lancashire and then straight on to York to participate in the flood rescue work.

During the period of the flooding in the county following Storm Desmond, Angela

## PRIDE OF SELLAFIELD LTD

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responded to a request to assist in the running of a Strategic Coordination Group (SCG) at Cumbria Police Headquarters in Penrith, in order to coordinate the strategic response to anticipated severe weather and flooding.

She made her way in very difficult travelling conditions. Her first shift was over 15 hours long, most of which she was the only briefing officer present. This meant all the vital functions the briefing officers perform fell to her to coordinate and complete before the next meeting.

Subsequently she provided further similar support to the flooding SCGs where she also adopted the role of mentoring less experienced colleagues delivering key support to county-wide responders at a time of severe crisis. She remained at her post, knowing that further support would not be forthcoming, delivering tasks to an extraordinarily high standard that were actually beyond her stated role.

Her response to the countywide emergency and capability of working with a range of agencies/organisations significantly contributed to the overall response to Storm Desmond.

The community hero award was a posthumous award, presented to **Ged Blaney**. Ged had a vision of setting up a support group for cancer sufferers and their families and carers at Sellafield. He took up the challenge and gathered support for the group from various representatives across Sellafield. The group would foster mutual help, cooperation and friendship between those affected by cancer, the people delivering the support, health care professionals and other organisations.

The group 'Stronger Together' was finally set up in January 2015 just two months before Ged's death. 'Stronger Together' is a lasting legacy to Ged's tenacity, courage and desire to help others. His family attended and the award was accepted by his son, Luke.

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# Outstanding Contribution Award for work with youth network

The work of our public affairs manager, Steve Barnes, in promoting the work of the Nuclear Institute Young Generation Network has been recognised with an outstanding contribution award.

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**S**teve Barnes, who is part of the Stakeholder Relations team, was presented with an 'outstanding contribution' award thanks to his support and promotion of the Young Generation Network (YGN) within our organisation and externally over the past 12 years.

YGN Chair Alys Gardner said: "The prize is awarded each year to someone who has gone above and beyond in their support of the Young Generation Network. Steve has been a strong supporter for many years and has been one of the key drivers behind Sellafield Ltd's involvement with us. This has included sourcing funding for individuals to attend our events, securing sponsorship and also providing support to our committee members as well as three past

Chairs. I'd like to thank Steve, on behalf of the Young Generation Network committee for all of his hard work and effort in supporting the next generation of nuclear industry professionals – a truly worthy winner."

The Young Generation Network is an ever-expanding group of young nuclear professionals, including our graduates and apprentices, that provides an opportunity for networking, education and career development through activities such as seminars, networking events and industrial tours. In June 2017, the UK will host the European Young Generation Network event in Manchester and we will be one of the key partners. ■





# Andy Smith

Representing Great Britain in four sailing world championships, being Commodore of the local sailing club, director of the Rosehill Theatre, and owning a film production company are just some of the achievements of the man at the helm of our new Corporate Centre. What makes a man who once survived a standoff with a six foot monitor lizard want to take up the role, and what exactly is the Corporate Centre?

### What is the corporate centre?

Essentially it is a 50 strong team – including our executive team – based at Albion Square, removed from the nuclear licensed site. Members of the executive, along with representatives from finance, planning, strategy, human resources, commercial, communications and transformation, will have space away from the day-to-day operations of Sellafield to focus on the longer term direction for Sellafield Ltd.

When the full executive was based on the Sellafield site it was easy for them to get caught up in the here and now, reacting to things like in-year funding constraints, and challenges around technical issues, but by physically moving away from the site we are able to concentrate on the future direction of the business; options for how we might do things differently, how we can accelerate different pieces of work, and how to ensure people and funds are assigned to the most important work. This further empowers our key operational staff to manage the day-to-day workings of the site which remains top priority.

### What is your role?

As director of the Corporate Centre it is my job to make sure that everyone stays focused on leading the business in the right direction, prioritising and integrating enterprise-wide activity, and ensuring we have clarity on the options and decisions required to move the business forward.

### How does it compare with other roles you have had in the company?

From my first role as manufacturing support in Thorp, High Level Waste Plants and then the Encapsulation Plants, through to more managerial roles in the planning and strategy side of the business, my experiences have given me a good grounding in the nuclear site and the nuclear business.

I understand how the shop floor works because I have been there, so I understand the needs of the business and the people at operational level. Our company though is part of a much bigger nuclear machine and I am fortunate that my more corporate roles have exposed me to the external and political environment that we work in, both in and around Sellafield, and also further afield working with Government and international customers. I hope that I can bring these diverse experiences to bear to help the Corporate Centre achieve what we need to achieve.

For the record I relish the role I am in, it is what I enjoy doing. I believe there is a bright future for Sellafield, its supply chain and communities. I wouldn't be doing what I am if I didn't believe in the future of the business, the area and the people.

### How is it working so far?

We are still in the early days, but the team has moved and settled in to their surroundings. The new management construct and governance structures are in place and we are working on some of the key strategy, planning and external engagement activities that will improve the way we manage the business as an enterprise. ■

## Andy's favourite things

**FAVOURITE BOOK?**  
THE FIVE PEOPLE YOU MEET IN HEAVEN BY MITCH ALBON

**FAVOURITE FILM?**  
GOOD WILL HUNTING

**FAVOURITE FOOD?**  
I'M NOT A FOODIE PERSON, I'LL EAT ANYTHING

**FAVOURITE HOLIDAY DESTINATION?**  
HAVELOCK ISLAND WHICH IS ONE OF THE ANDOMAN ISLANDS, SOUTH EAST OF BURMA

**FAVOURITE BAND?**  
THAT'S EASY, THE SMITHS

# Sellafield

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**Read:**  
Our new  
strategy

**Meet:**  
Our new  
transformation  
director

**In Focus**  
Our Site Ion  
Exchange Plant

A decade of  
performance  
and delivery

**Available  
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What do  
Sellafield and  
space exploration  
have in  
common?



The answer might surprise you, but it's only a small part of the Sellafield Story.



The Beacon  
West Strand, Whitehaven  
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[www.thebeacon-whitehaven.co.uk](http://www.thebeacon-whitehaven.co.uk)

Hands-on activities and virtual reality tell the story of the most iconic nuclear site in the world. From its pioneering use of the atom to support national defence and building the world's first civil nuclear power station, to the clean-up challenges of today.

**Explore the Sellafield Story at the Beacon Museum:**  
Tuesday to Sunday 10am-4:30pm. Monday opening is restricted to Bank Holidays and school holidays.