

Sellafield site overview

Safely delivering excellence in decommissioning, waste management and reprocessing





People, Partnerin

Under the ownership of Nuclear Management Partners, a consortium made up of URS, Areva and AMEC, we are safely delivering nuclear decommissioning, waste management and commercial operations at Sellafield in West Cumbria.



We are managing one of the most complex nuclear sites in the world



Sellafield site

Covering an area of four square kilometres on the West Cumbrian coast, Sellafield spans the entire history of the UK's civil nuclear industry.

Sellafield is one of the most complex and compact nuclear licensed sites in the world. Over 1,000 facilities simultaneously perform a range of nuclear operations and many are dependent on each other. These operations include decommissioning, the processing and storage of low, intermediate and high level wastes and fuel manufacturing and recycling.

The Sellafield site is as old as the UK's nuclear industry itself, having started life during the Second World War. While the site and our commercial focus have changed in many ways; our commitment to demonstrating excellence in the nuclear field remains.

When it started operations during the Second World War, Sellafield was known as Windscale and was home to factories producing TNT explosives in support of the war effort.

Sellafield is also home to the world's first commercial nuclear power station, Calder Hall, which was opened by Her Majesty Queen Elizabeth II in 1957 and operated safely for almost fifty years.

Our experience across the nuclear fuel cycle; from operating a reactor; designing, commissioning, operating and decommissioning a nuclear facility and safely managing low, intermediate and high level waste is all being utilised to deliver world class operations and accelerated high hazard risk reduction at Sellafield.

g, Performance



Decommissioning



Reprocessing



Waste management

We employ over eight thousand of the most experienced and highly regarded nuclear workers in the world at Sellafield.

Our People

"Working at Sellafield requires dedication, disciplined professionalism and a range of technical skills and experience. We are committed to expanding this skills base and to supporting the next generation of nuclear workers."

David Mc Nerney, HR Director



Our challenge at Sellafield is unique. With over one thousand buildings to decommission and demolish and many more facilities that support the processing and storage of nuclear waste; working at Sellafield is not an average nine-to-five career.

Over eight thousand of our employees work at Sellafield safely delivering hundreds of nuclear decommissioning projects while simultaneously managing, processing and storing low, intermediate and high level nuclear waste; reprocessing used nuclear fuel from around the world and manufacturing new fuel; and applying innovative engineering solutions.



Continual learning underpins our world class performance



Whether our employees work in a plant or an office; wear a respirator or a suit; manage waste or reprocess fuel; they are all helping to deliver accelerated high hazard risk reduction on behalf of our customer, the Nuclear Decommissioning Authority.

Our safe delivery of commercial operations such as reprocessing and fuel manufacturing raises additional revenue that we can use to accelerate high hazard risk reduction.

We safely manage, process and store all levels of radioactive waste that arises from our decommissioning and commercial operations.

Our design and implementation of engineered solutions will continue to help us to get the best out of our facilities, constantly raising our performance.

We are committed to the development of our employees and the skills that they need to meet the future challenges of the organisation. This commitment includes supporting the next generation of nuclear workers through our socio-economic programme of support and involvement with educational establishments from primary schools to universities.

We routinely measure radiation doses around our sites



One in five

of our employees have a specific safety role – helping to ensure our safety performance is world class across our operations and sites.

At Sellafield we are safely delivering a diverse portfolio of nuclear decommissioning, waste management, fuel manufacturing and recycling.

What we do:



Our sites are home to the most diverse nuclear portfolios in the world.

Sellafield covers four square kilometres and is home to some of the UK's oldest facilities including the world's first civil nuclear reactor – Calder Hall. It is also home to our commercial operations including the Thorp and Magnox reprocessing facilities and our fuel manufacturing capability with the Sellafield MOX Plant.

Our decommissioning and commercial operations at Sellafield are underpinned by an exceptional track record in nuclear waste management. With over fifty years experience in this area our employees are able to manage, process and store low, intermediate and high level waste.

All of our operations at Sellafield are done on behalf of, and under contract to, the Nuclear Decommissioning Authority whose mission of high hazard risk reduction echoes our own determination to decommission the legacy on our sites.

Our portfolio at Sellafield is unique and so is our track record. We have proven capability at the site in the fields of nuclear decommissioning, nuclear waste management and reprocessing.

Building on our track record, we are constantly striving for raised performance from all of our sites, facilities and employees.

We will continue to engage with our stakeholders as we seek to safely realise our vision of achieving the Nuclear Decommissioning Authority's assigned missions through safe, sustainable, world-class performance to become the site and workforce of choice for potential new missions.

We have over 25 years experience on some of the most challenging projects in the world, ranging from plutonium reactor chimneys through to laboratories used for medical research.

Decommissioning

Since the formation of the Nuclear Decommissioning Authority we have shifted our emphasis to accelerating decommissioning activities.

At Sellafield and Capenhurst we are undertaking some of the most challenging and complex nuclear decommissioning in the world to safely achieve the NDA's mission of high hazard risk reduction.

The portfolio includes:

- Magnox and Pile fuel storage ponds
- Nuclear Reactors
- Solid nuclear waste stores
- Legacy reactor exhaust stacks
- Legacy reprocessing plants
- Contaminated land
- Sea discharge lines

What is there to decommission?

- 170 major nuclear facilities and 2,200 other buildings dating from the 1940s
- 1 million m³ of concrete above ground, 1 million m³ below ground
- Approximately 61,000m³ conditioned intermediate level waste
- A number of facilities are currently operational which once they get to the end of their operational life will need to be decommissioned – these include Thorp, waste treatment plants and a number of office accommodation buildings

Our decommissioning portfolio is one of the largest and most diverse in the world today, with a total value of approximately

£23 Billion



We are world leaders in nuclear waste management, having successfully processed and stored low, intermediate and high level nuclear waste from UK and overseas customers at our sites for over 50 years.

Waste Management

We deliver an integrated nuclear waste management programme which seeks to reduce waste volumes arising as part of our current commercial activities as well as historic operations, ensuring that waste is stored safely, minimising the risk to the public and environment.

We have made major advances in the treatment of these wastes over the past 30 years with the development and implementation of comprehensive waste management processes and techniques. These include the development and introduction of encapsulation technology used to treat intermediate level waste.

Significant progress has already been made with the retrieval and treatment of historic as well as current waste arisings. Future challenges in waste management lie in supporting the delivery of high hazard reduction at Sellafield and Capenhurst and acceleration of this mission.

The greatest technical challenge we face is the cost-effective retrieval and treatment of the historic wastes at Sellafield.



High level waste (HLW) – the most radioactive form of nuclear waste and is produced as part of our reprocessing operations. At Sellafield, we vitrify the high level waste into a solid form, reducing its volume to one third of its original size.



Intermediate level waste (ILW) – less radioactive than high level waste and includes fuel element cladding, contaminated equipment and radioactive sludge. We store ILW in stainless steel drums, which are filled with cement grouting and placed into special above-ground storage facilities at Sellafield.



Low level waste (LLW) – slightly radioactive and includes protective clothing, laboratory equipment, paper towels and gloves which have been used in the controlled areas of a nuclear site, hospital or nuclear research centres. We compact this waste and transfer it to the Low Level Waste Repository for disposal.



Nuclear plants at Sellafield are designed to ensure the highest standard of radiological protection for our people, communities and the environment



Reprocessing



Reprocessing takes used fuel which has been removed from a nuclear reactor to recover the reusable materials. After about four years in a reactor the fuel becomes less efficient however reprocessing allows 97% of this used fuel to be recycled back into new fuel.

Reprocessing has been carried out at Sellafield for well over five decades and in this time more than 50,000 tonnes of fuel has been safely separated. If all of this used fuel were to be recycled into new fuel, it would generate enough electricity to meet all of the UK's electricity needs for over two years.

There is a huge amount of reprocessing experience at Sellafield which has been technically proven as the effective way to treat used nuclear fuel.

The very first reprocessing facility was opened in the early 1950s. Then in the 1960s the Magnox reprocessing facility started operating and is still operating to this day. It is regarded as the workhorse having reprocessed over 44,000 tonnes of fuel. The Thorp reprocessing facility began reprocessing back in 1994 and has recently sheared its 6,000th tonne of fuel.

Sellafield has reprocessed fuel from nuclear reactors in both the UK and abroad.

50,000 tonnes
of fuel have been reprocessed
at Sellafield

The complexity of Sellafield, the age of its infrastructure and the interdependent nature of its facilities and operations will continue to provide a unique nuclear challenge.

The Challenge

"There is nowhere else in the world where you can find the number or complexity of operations that all happen within a four square kilometre footprint. We are talking about fifty year old buildings needing to be decommissioned a stones throw away from a construction site and active buildings and about operations that are dependent on the performance of other facilities on the site. This is what our workforce delivers every single day and this is where we excel."

Bill Poulson, Managing Director



We are tackling many individual challenges at Sellafield. The overall challenge for the site and for Sellafield Ltd as a whole is to deliver accelerated high hazard risk reduction on behalf of our customer, the Nuclear Decommissioning Authority.

Some of our plants at Sellafield are degraded and, despite our continuing care, continue to deteriorate. The facilities hold some of the UK's highest nuclear hazards and we are dedicated to expertly reducing those hazards.

This will be done by designing, building and integrating waste retrieval equipment, preparing the facilities for retrieval operations and then retrieving and immobilising or treating the waste to put it into a safe state.



Cost-effectively retrieving and treating waste



Safety and protection of our workforce remains our top priority

This presents us with significant challenges, however by applying modern techniques and treatments to the decommissioning process we are able to deliver excellent work, and deliver it safely.

Our commitment to applying best practice and fit-for-purpose solutions will see us continue to work in partnership with our workforce, supply chain and parent body organisations; applying all of our available resources to achieving our mission.



We are committed to open, transparent partnering with all our stakeholders

From the birth place of the UK's commercial nuclear industry to its ability to manage all forms of nuclear waste; Sellafield is home to excellence.

Our successes

Calder Hall demolition

Sellafield dates back to the beginning of the UK's civil nuclear industry and is home to the world's first commercial nuclear reactor, Calder Hall. Calder Hall ceased operations in 2003 after almost fifty years of successful performance. The four cooling towers at Calder Hall were demolished in September 2007, drastically altering the West Cumbrian skyline. Work to decommission the remainder of Calder Hall is ongoing.



Waste Management performance

Sellafield is the only nuclear site in the UK that can manage, process and store all three levels of nuclear waste; low level, intermediate level and high level. Low level waste from Sellafield, hospitals and research facilities is compacted to reduce its volume before being sent to the Low Level Waste Repository. Intermediate level waste is mixed with grout and stored in stainless steel drums in specially engineered above ground stores. High level waste is vitrified, reducing its volume and rendering it into a safe and stable form ahead of transportation and storage.

Our proven performance in the field of nuclear waste management has seen us safely manage nuclear waste for over...

50 years

Recycling used nuclear fuel



The recycling of used nuclear fuel that has been in a nuclear reactor for around four years is another unique capability that we deliver at Sellafield. In the absence of reprocessing the used fuel would need to be disposed of as waste.

De-sludging activities under way

Work to decommission two of the highest hazards at Sellafield has commenced, with the start of de-sludging activities in the Pile Fuel Storage pond.

Sludge, in the form of corrosion products and wind blown materials, has been mobilised from two of the twelve bays where fuel was decanned and exported for reprocessing, by the use of water lances and flushed back into the main pond. This enables it to be retrieved and moved to an in-pond corral for storage prior to the construction of a new interim storage and treatment facility, currently under way.

In addition, we have also installed and started to operate a Local Effluent Treatment Plant to help treat and control activity in the pond water.





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Sellafield Ltd is owned by Nuclear Management Partners and operates on behalf of the Nuclear Decommissioning Authority

