



United Kingdom  
National Nuclear  
Laboratory



# Purpose



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## We are the government's lead civil laboratory for nuclear fission

We provide the science, technology and world-leading laboratories to support the country's civil nuclear programmes and ensure they are delivered safely and cost-effectively.



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# We are a Public Sector Research Establishment – government owned and customer funded

By reinvesting our earnings into cutting-edge science and research, we maintain a broad base of knowledge and practical capability to keep the UK flexible, adaptive and competitive.



**Our mission is to enable and deliver nuclear outcomes for government, and to support growth of the UK nuclear sector**



## To achieve our mission we will:

- Be a custodian of national capabilities and infrastructure critical for national and energy security
- Deliver practical nuclear research and enable decommissioning programmes
- Become government's lead civil technical and strategic advisor for nuclear fuels and nuclear materials
- Provide expertise and facilities to be a platform for the private sector to accelerate the deployment of technology to market
- Carry out research to continue securing the safe operation of nuclear plants domestically and internationally
- Champion and nurture advanced nuclear skills

## UKNNL is pushing the boundaries of nuclear science, technology and innovation

Working with our partners in government and across our sector, we ensure the safety, longevity and efficiency of the country's existing nuclear sites.

We champion new technologies and capabilities that will enable an exciting new generation of nuclear reactors.



## A key UK voice in the international nuclear community, facilitating partnerships with our global counterparts for mutual benefit

Through specific action plans and programmes, we deliver collaborative research and development to support growth opportunities, and to share expertise, resources and best practice.



## We can trace our roots back to the 1950s

This is Windscale laboratory in 1954, with some of the world's first glove boxes.

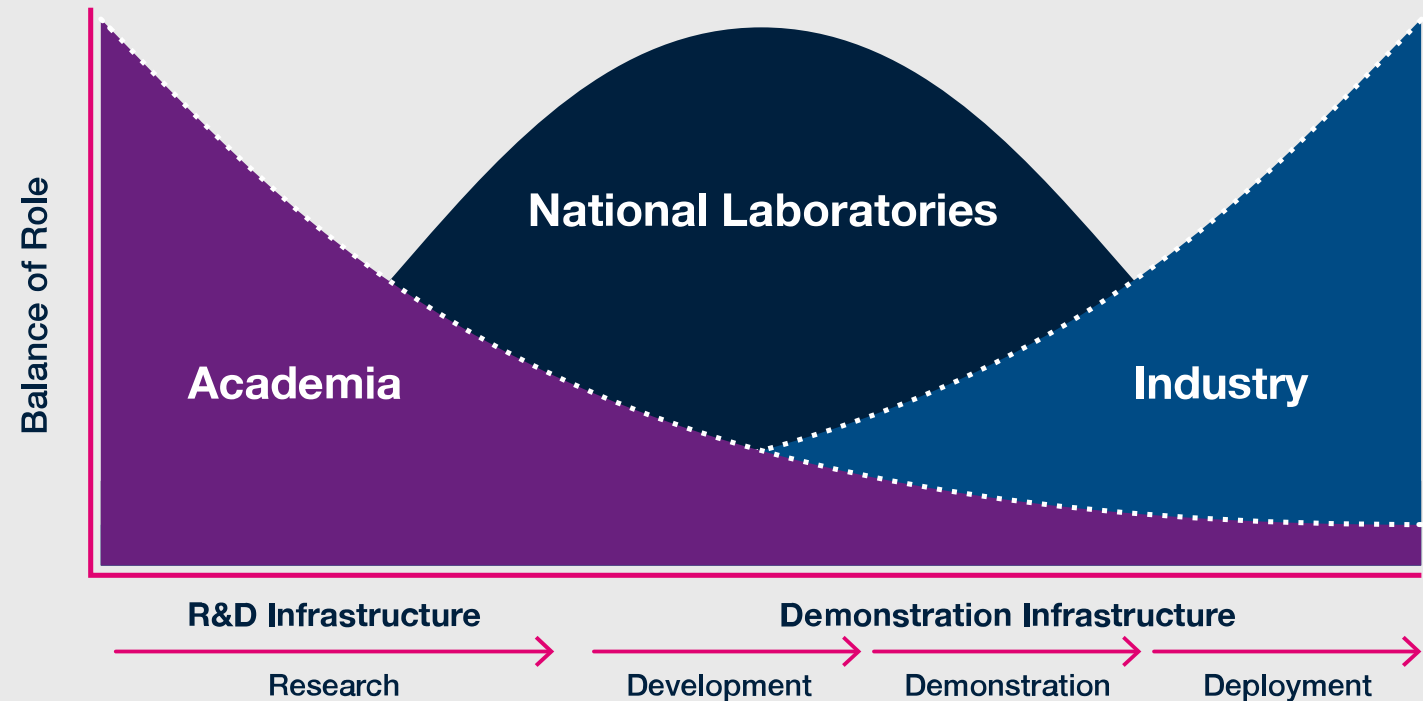
Today, our scientists work on the same site, which is now home to our state-of-the-art Central Lab. They are supporting power generation for millions of homes and the UK's national security.

UKNNL is proud of and confident in its deep technical capabilities and nuclear expertise deployed to support the national nuclear mission now and for decades to come.



# Our unique role in technology development

UKNNL occupies a unique position in the nuclear innovation environment, spanning technology readiness levels from 'proof of concept' to full scale demonstration and beyond; taking science from inactive laboratory-scale demonstration to prototype deployment with active nuclear materials.





# People

# UKNNL is home to some of the world's most skilled and experienced nuclear professionals

We are proud that the qualities of our people are a match for our unique infrastructure: from researchers, technicians and scientists, to data specialists, engineers and other vital supporting teams.



# Attracting and nurturing great people to develop their careers in nuclear

Since 2014, **127 Apprentices** and **150 Graduates** joined our Early Careers programmes. We have welcomed 48 new joiners to our pioneering post-doctorate programme since 2021 – the first of its kind in the nuclear sector.

**Women represent 32% of our workforce** and 25% in STEM roles – significantly above the sector average.



# Championing advanced nuclear skills and developing expertise

13,000

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Combined years  
of nuclear sector  
experience

22

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Fellows: World-  
leading scientists  
and engineers

150

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PhDs started in  
the last 5 years

370

Publications in  
the last 5 years

# The UKNNL leadership team



**Julianne Antrobus**  
Chief Executive Officer



**Dr Gareth Headdock**  
Chief Science and  
Technology Officer  
Deputy CEO



**Wayne Muckley**  
Chief Operations Officer



**Des Wright**  
Chief Nuclear Officer



**Rebecca Jenkins**  
Chief Human  
Resources Officer



**Brian Tenner**  
Chief Financial  
Officer



**James Murphy**  
Chief Customer Officer

**Our values inform  
our actions and act  
as our compass to  
guide our future**





# Performance

# Delivering programmes of national importance

## DEFENCE



Supporting the Royal Navy  
to protect our nation



Helping the UK to keep the  
country safe

## GENERATION



Working with EDF in  
helping the UK on its  
journey to net zero



Helping to power prosperity  
across the UK

## DECOMMISSIONING



Collaborating with the  
NDA Group to clean up  
the UK's earliest nuclear  
sites and manage nuclear  
waste



Helping to deliver the clean power  
mission

## GOVERNMENT AND NEW BUILD



Enabling the future by  
supporting new nuclear  
capacity in the UK



Helping the UK become a clean  
energy superpower

# Developing nuclear science and technology

## CORE SCIENCE



### Protecting and advancing foundational nuclear knowledge

Delivering cutting-edge scientific experiments, in collaboration with academia and international partners, to build nuclear knowledge and develop expertise.

## INNOVATION



### Deriving value and impact from science and technology

Driving a challenge-led innovation culture, developing new ideas and bringing them to our customers efficiently. For example, a novel method using low frequency ultrasound technology to decontaminate waste, in minutes not days, which has the potential to reduce costs and hazard.

## STRATEGIC RESEARCH



### Working collaboratively on targeted research

Operates UKNNL's collaboration centres (e.g. the IAEA-UKNNL Advanced Fuel Cycles Collaborating Centre) leveraging national and international capability and investment for the benefit of the UK.

# Areas of technical expertise

## FUELS, REACTORS AND REPROCESSING



Developing and studying nuclear fuels, from creation to recycling and reprocessing.



**Rolls-Royce**



Department for  
Energy Security  
& Net Zero

## WASTE MANAGEMENT & DECOMMISSIONING



Conducting leading research and operational support for treating all levels of nuclear waste, including decontamination and disposal solutions.



**Nuclear Waste  
Services**



## NUCLEAR OPERATIONS



Delivering technical expertise and safety solutions to keep UK nuclear facilities running securely through modelling, robotic plant intervention and analysis.



**Sellafield Ltd**



Ministry  
of Defence

**We are custodians  
of national nuclear  
research, development,  
capabilities and  
infrastructure**

**£2bn**

The value of the  
nuclear facilities  
we manage

Workington  
Laboratory

Central and  
Windscale  
Laboratories

Preston  
Laboratory

Warrington

Culham

Stonehouse



# Our laboratories: Central

One of the most advanced nuclear laboratories in the world, home to plutonium science research capabilities, with glove box facilities and a versatile active rig hall. Central Laboratory plays a pivotal role in the UK's ability to handle plutonium and find solutions for its long-term disposal.



Central  
Laboratory and  
Vitrification  
Test Rig

## Vitrification Test Rig

A full-scale, non-active facility designed to replicate the core processes to develop and optimise methods for immobilising high-level radioactive waste in a stable glass form.

# Our laboratories: Windscale

Capable of forensic post-irradiation examination of full-size nuclear fuel rods, reactor core components and a range of high-radioactivity items. It is here that we support programmes of national importance, supporting EDF's power plants and our submarine fleet.

Windscale's scientists and engineers provide a unique blend of skills, using equipment to handle the most highly-active materials.



Windscale  
Laboratory

# Our laboratories: Workington

A dark blue map of the United Kingdom is shown. A bright blue circle is positioned over the northwestern coast of England, with a thin line connecting it to a larger, semi-transparent blue circle containing the text 'Workington Laboratory'.

Workington  
Laboratory

A non-active science, engineering and rig-testing facility, that complements our active facilities. A wide range of equipment and flexible areas that can enable the efficient design and implementation of non-active trials as a precursor to active trials in our laboratories.

Home to multidisciplinary teams that can demonstrate technologies to support across the breadth of the industry.

# Our laboratories: Preston

A dynamic hub with cutting-edge laboratories for research and development of advanced fuels and HALEU (High Assay Low Enriched Uranium). Home to the prestigious IAEA Collaborating Centre for advanced fuel and fuel cycles, a global hub for research, training and development

Many of Preston's resident scientists are specialists in the treatment of legacy waste material, recycling uranium residues and nuclear medicine.

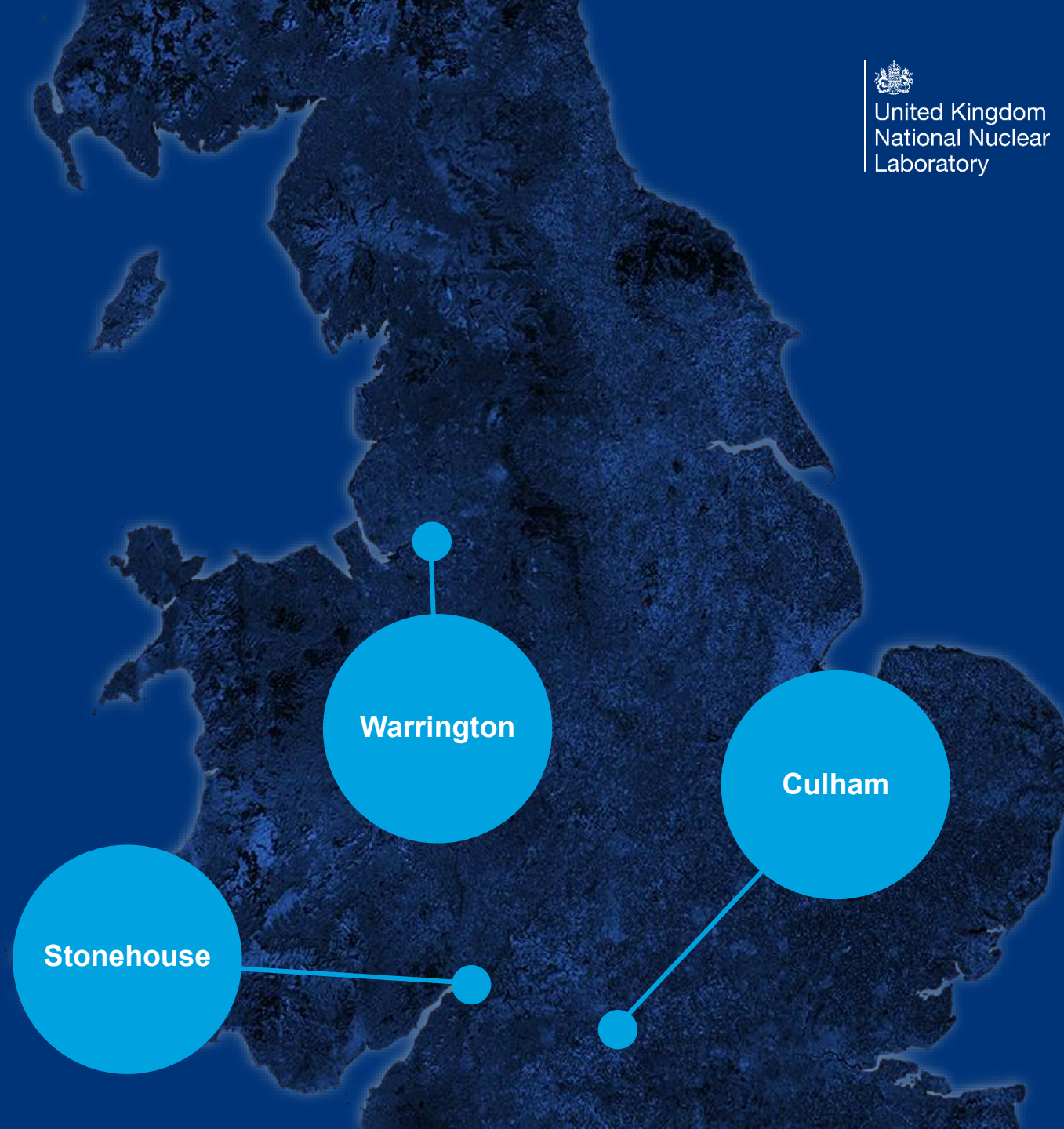


# Our offices

## Supporting our operations

UKNNL's HQ is in Warrington, a hub for nuclear in the North West.

Our offices deliver a range of modelling and simulation solutions and are home to our professional services and support functions.





## Adding value to our local communities through purposeful interventions

We deliver programmes to make the most difference, where our colleagues live and work, and across the UK.

We plan long-term outcomes to increase science capital, improve perceptions of nuclear and support jobs in the sector.



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# Thank you

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