

# National Nuclear Laboratory At A Glance

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# Innovation Delivered

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The UK's National Nuclear Laboratory offers an unrivalled breadth of technical products and services to our customers across the whole nuclear industry. We cover the complete nuclear fuel cycle, from fuel manufacture and power generation to reprocessing, waste treatment and disposal.

We deliver the right amount of innovation to deliver our customers' needs. This can range from simply drilling a hole to analyse underground wastes with our integrated microdrilling technology through to the development of state-of-the-art power systems for spacecraft, based on radioactive materials.

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## Key Facts and Figures (2013/14)

|            |                                       |
|------------|---------------------------------------|
| Revenue:   | £85.4 million                         |
| Profit:    | £8.1 million                          |
| Employees: | Around 800 (including 450 scientists) |
| Locations: | 6 throughout the UK                   |

## What is important to us in our business dealings?

- Innovation
- Integrity
- Impact

## What services do we provide?

- Measurement and Analysis
- Environmental Services
- Waste Residues and Processes
- Waste Management Technology
- Fuel and Radioisotope Technology
- Spent Fuel Technology
- Safety Management
- Asset Care
- Homeland Security and Non-Proliferation
- Access to Facilities

## Who are our principal customers?

Sellafield Ltd  
EDF Energy  
US Department of Energy  
Babcock  
Westinghouse  
Ministry of Defence  
Nuclear Decommissioning Authority  
UK and International Governments  
European Union



The Central Laboratory, Cumbria - Unique in the UK

### Who are we?

The UK's National Nuclear Laboratory (NNL) is a company owned by the UK Government. NNL operates as a commercial business and receives no direct grant funding from Government. We generate an operating profit which is either returned as a dividend to Government or re-invested in the business.

With over 10,000 person-years of nuclear industry experience across the whole fuel cycle, our core business is to provide the experts and technologies to ensure the UK nuclear industry operates safely and cost-effectively today and for the future.

### Business objectives

In addition to operating safely and delivering to our customers, our objectives include:

- Helping to safeguard the UK's strategic nuclear skills and capabilities
- Developing our customer base into new markets
- Optimising the utilisation of our world-class facilities
- Supporting the growth of the communities where we operate, with particular emphasis on West Cumbria

# What can we do for you?

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NNL offers products and technical services across the whole range of nuclear industry sectors.

## Measurement and Analysis

- Chemical, fingerprint, ILW and Low Level analysis
- Online wet chemical analysis
- Plant instrumentation
- Transport QA and safety
- Detection and measurement

## Waste Management Technology

- Immobilisation technologies
- Chemical and process development
- Waste behaviour and materials
- Vitrification

## Safety Management

- Chemotoxic and asphyxiation assessment
- DSEAR
- Training
- Criticality safety
- Regulatory support
- Peer review
- Hazard identification
- Radiological assessment

## Asset Care

- Impact and structural modelling
- Remote engineering
- Technical consultancy
- Thermo fluids

## Waste Residues and Processes

- Decommissioning residues
- Waste residues assessment, characterisation and processing
- Organic wastes and residues
- Post irradiation examination

## Spent Fuel Technology

- Actinide chemistry
- Chemical and process modelling
- Radioisotope separations
- University contracts
- Engineering design

## Security and Non-Proliferation

- Security and safeguards
- Nuclear security and vulnerability assessment

## Environmental Services

- Geochemistry and hydrology
- Sampling, monitoring and in-situ analysis
- Contaminated land assessment
- Waste and inventory assessment
- Effluents and environmental chemistry

## Fuel and Radioisotope Technology

- Fuel cycle assessment
- Design and performance (inc. reactors)
- Product development and QA (inc. codes)
- Nuclear physics





## Our Facilities

We operate some of the most advanced facilities in the world, providing a range of services for our customers.

### Sellafield/Windscale

- High active, alpha, beta and gamma cells
- Plutonium and MOX facilities
- Active/non-active laboratories
- Full scale test facilities
- Large flexible shielded facility for post irradiation examination
- Full scale Vitrification Test Rig

For more information about our facilities, please ask for a copy of our Facilities brochure or visit [www.nnl.co.uk/facilitiesbrochure](http://www.nnl.co.uk/facilitiesbrochure)

**Note:** NNL's activities in its leased facilities at Springfields (Preston Lab) and Sellafield (Central Lab and Windscale Lab) are operated under Command & Control regimes by Springfields Fuels Ltd and Sellafield Ltd respectively. Activities carried out under those regimes are constrained by the relevant Environmental Permits and Nuclear Site Licences held by Springfields Fuels Ltd and Sellafield Ltd.

### Workington

- Non-active test rig facility

### Preston

- Active laboratories capable of handling uranic materials up to production scale
- Engineering facilities for large scale testing

### Risley, Stonehouse and Harwell

- Office based activities in support of UK and international customers

# Innovation Programme

NNL's Innovation Programme consists of three components: Signature Research, Entrepreneurial R&D and Strategic Projects.

## Signature Research

A series of 4 Signature Research Areas have been identified as being central to the National Nuclear Laboratory mission. These areas encompass activities which are of strategic importance to the UK and worldwide nuclear industry. In addition, these areas act as a focus for the £1 million NNL invests each year to further nuclear research and development.

### Nuclear Energy

Covers spent fuel and nuclear materials, specifically focusing on supporting ongoing operations, disposition of spent fuel, civil plutonium and uranium. This also includes fuel and reactors, specifically all supporting research, ranging from the fuel and reactor design, through to irradiated fuel.

### Waste Immobilisation, Storage and Disposal

Covers all aspects of waste immobilisation and processing aimed at producing waste forms suitable for interim storage and disposal.

### Legacy Waste and Decommissioning

Covers all NNL research associated with the management of post operational legacy of nuclear operations through to their end point. This includes the associated legacy of inventory, equipment, plant and site.

### Nuclear Security and CBRN (Chemical, Biological, Radiological, Nuclear)

Covers research associated with the security of nuclear facilities and materials, with a key focus on non-proliferation of nuclear technology and materials and the enhancement of UK resilience to CBRN threat.

## Entrepreneurial Research and Development

NNL invests in its own internal innovative ideas that may result in new products and services without having to be nuclear industry focused.

## Strategic Projects

The primary focus of these projects is the potential for significant impact via scientific breakthrough in areas aligned with a national programme. Collaboration with academia, other national laboratories and industry partners to maximise programme size and impact is key to these projects. Leverage of additional funding and maintenance of critical skills are also important. Projects may typically run over several years.

## Technology Commercialisation

A principal outcome of NNL's innovation programme is the creation of income from the commercial deployment of NNL-developed technologies and intellectual property, generally through licensing agreements with commercial firms in the nuclear industry.







**Winner**  
**RESEARCH & DEVELOPMENT**  
**Sector Award**

Winner 2004 - 2008, 2010 - 2011, 2014  
Highly Commended 2009, 2012, 2013



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LABORATORY 