

# A skills report for the nuclear industry

**NUCLEAR  
INDUSTRY**



**cogent**

*Skills for Science  
Based Industries*

# Foreword



This Skills Report for the nuclear industry sets out how we are working with nuclear employers to support workforce skills development – an ongoing process that takes account of a changing landscape and an exciting future ahead.

We are guided by employers: an employer-led Board directs our strategy; our Nuclear Employers Steering Group defines our programmes, with wider consultation through the Nuclear Advisory Council; we run extensive consultations on qualifications and we gather detailed Labour Market Information (LMI).

Our research has placed a renewed focus on the nuclear industry and particularly the new build agenda. We embarked upon a series of four Nuclear Renaissance reports which cover all aspects of the nuclear fuel cycle for the civil and defence programme and new civil build up to 2025.

Cogent's sector-wide Nuclear Industry Training Framework includes nuclear Job Roles, qualifications and industry standards relevant to the industry. The framework is the benchmark for employers for skills gap analysis and has been shaped by Industry for industry. It provides input to the National Skills Academy's Nuclear Skills Passport and the Cogent Skills Match tool.

Our standard-setting remit has seen us continue to deliver a raft of Job Context role standards for industry. Where the industry carries out a range of courses for the same subject, we've produced training standards, with the input of subject experts.

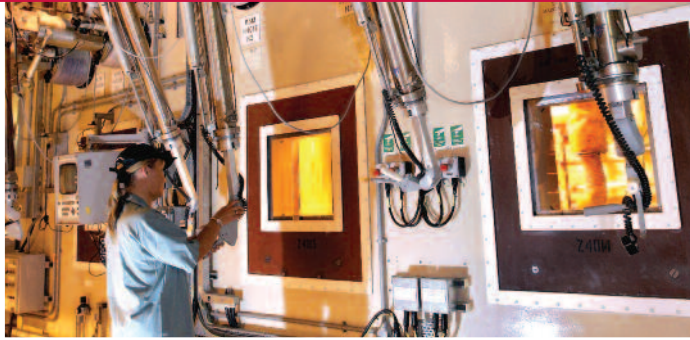
We're developing a higher level skills strategy which promotes innovation. Our new employer-led Foundation Degrees will play a critical part in driving up these skills.

The National Skills Academy for Nuclear is taking our qualifications and standards and delivering them via the quality assured provision of training and development aimed at technical, associated professional, and management levels.

Thanks must go to all the employers and partners for their vital contribution to the skills agenda.

We look forward to continuing our work with them to bring young people in both through apprenticeships and from university; to upskill and re-skill the current workforce and to ensure the industry has the high level skills it needs.

Joanna Woolf,  
CEO



# Our objectives

Cogent is the Sector Skills Council (SSC) for the Chemicals, Pharmaceuticals, Nuclear, Oil and Gas, Petroleum and Polymer Industries.

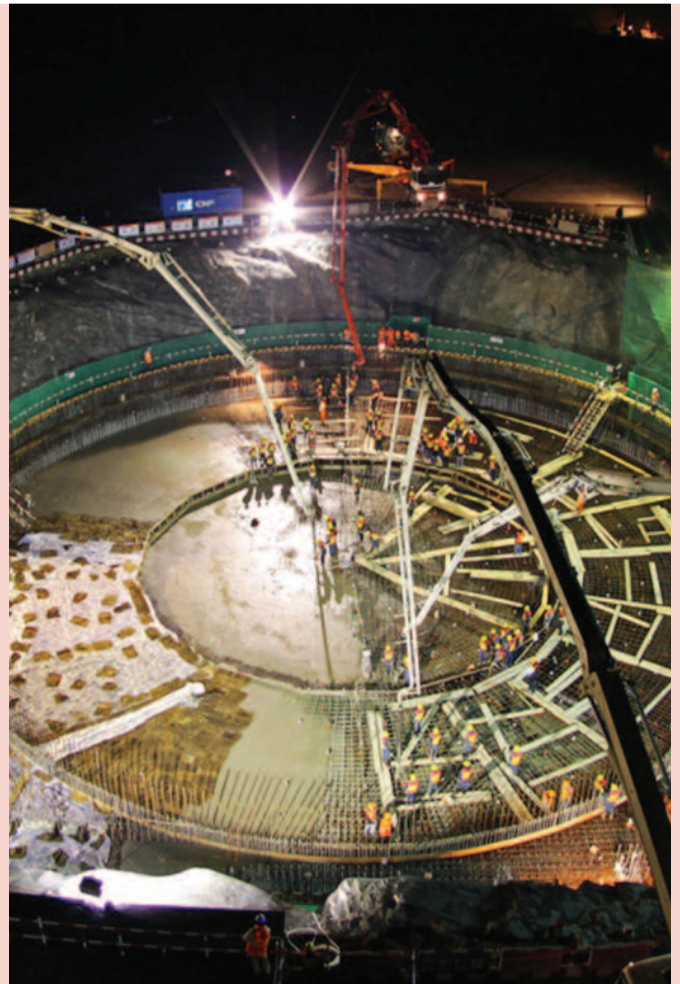
Cogent's Mission is:

To meet the skill needs of the Cogent industries to allow them to compete successfully.

We are doing this through:

- Being the voice of employers on skills
- Designing qualifications
- Attracting young people into the Sector
- Understanding industry skills needs

Photo of Sanmen concrete pour, China, courtesy of Westinghouse UK ▶



# Our strategic action plan

Cogent and the National Skills Academy for Nuclear are working together to ensure a highly skilled workforce. Cogent is developing the standards and qualifications and the Skills Academy is transforming learning through its quality assured provider networks around the UK.

The Cogent Nuclear Employers Steering Group (NESG) was established to provide strategic advice to the Nuclear Directors on Cogent's main Board and Executive. It provides a focus for working hand-in-hand with employers to develop skills solutions.

Through our Strategic Action Plan we are developing the products, services and initiatives for the nuclear industry and delivering them through working in a Strategic Skills Alliance with the National Skills Academy for Nuclear.

Cogent's remit is delivered through five "Big Tickets", each one of which has a focused programme of activity.

# 1

# Cogent Industry Skills Standards and Qualifications

Cogent is developing a suite of employer-led qualifications that underpin its competency-based Job Contexts. Take-up and completion of Level 3 Cogent Sector qualifications has seen an increase since Cogent's inception:

Cogent Sector S/NVQs	2005	2009	% increase
Level 2	1330	1495	12%
Level 3	275	595	116%

## We have delivered

### Nuclear Industry Training Framework

The Nuclear Industry Training Framework (NITF) provides a web-based database of qualifications and training and the associated standards right across nuclear industry. It provides the benchmark function for employers for skills gap analysis and enables transferability of skills and mobility of staff through the Academy's Nuclear Skills Passport.

[www.cogent-prospectus.com](http://www.cogent-prospectus.com)

### National Occupational Standards

Cogent continues to work closely with employers to develop high quality and useable National Occupational Standards (NOS) which are the building blocks for vocational qualifications.

### Training Standards

We have worked with nuclear employers to develop standards for the benchmarking of training across the Civil Nuclear Industry. The development of these important standards has taken place in consultation with many subject areas.

### 14-19 Diplomas

Cogent has continued to steer the development of the new Engineering Diploma and the Manufacturing and Product Design Diploma. Diplomas are a new qualification for 14-19 year olds which are designed to develop invaluable work related skills.

### Higher Education (HE)

**Foundation Degrees:** Foundation Degrees are degree level qualifications which combine academic study with workplace learning. Cogent's ground-breaking collaborative project *Working Higher* is developing a Framework for Foundation Degrees in Science and Engineering. It includes the FdEng Nuclear, to be delivered by the University of Central Lancashire.

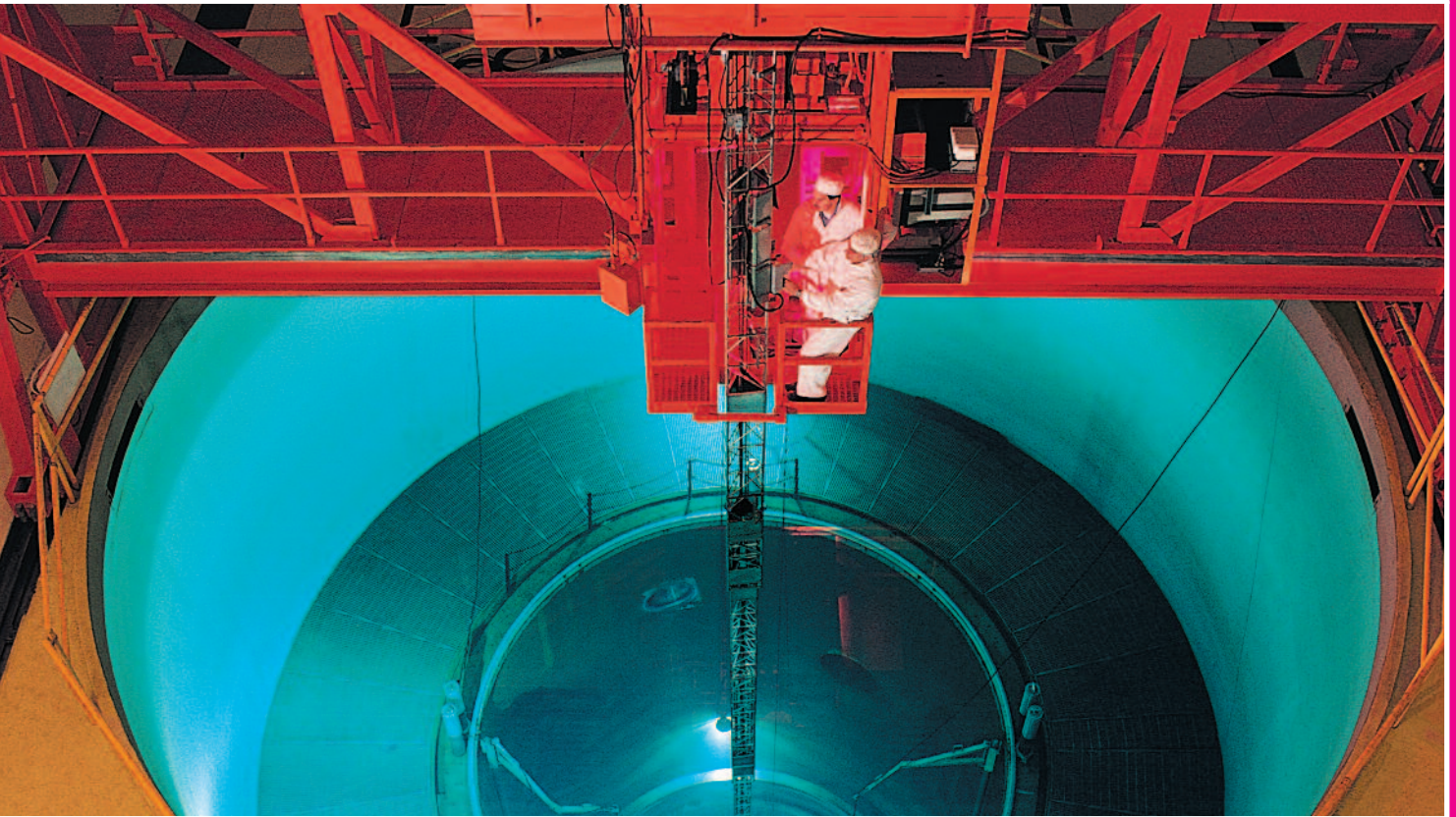
**HE courses:** There are a number of nuclear HE courses including a variety of modules on Honours degree courses and MScs, many of which are available as part of an HE qualification or as Continuing Professional Development (CPD) modules. These can be found at: [www.nuclearliaison.com](http://www.nuclearliaison.com)

### Nuclear Industry NOS

Safety Case Preparation
Radiation Protection
Nuclear Regulators
Nuclear Decommissioning
Radioactive Material Transport
Ionising Radiation Measurement

Another current project is ongoing around cross-sector sustainability NOS.





# We are working to

## Agree

We are working to agree with industry the appropriateness of qualifications or common Industry Training Standards.

## Develop

We are developing a suite of vocational qualifications and training standards for the nuclear industry aligned with the development of Job Contexts and the Skill's Academy's Nuclear Skills Passport, which promote skills transferability.

## Ensure

We are working to ensure 'fit for purpose' modules to be included in all products, from vocational qualifications to MScs, which can be offered on a 'pick and mix' basis, contextualised for employment within the nuclear industry.

## Build

Through the UK Human Performance Forum (HuP) we are building safety behavioural and attitudinal training requirements into the industry qualifications based on international standards.

## Work

We are working with Higher Education to develop a range of provision from entry level to the HE sector, including 14-19 Diplomas and Foundation Degrees, through to Honours Degrees and post-Graduate education programmes.

## Produce

We are working with the Skills Academy to produce a catalogue of funded courses and accredited training providers taking account of the Skill's Academy's accredited training provider network.

# 2

# Cogent Skills Benchmarking

Cogent is setting the standard for skills in the Sector and developing the tools to allow companies to assess their performance.

## We have delivered

### Nuclear Job Contexts

We have continued to develop Nuclear Job Contexts covering the key roles across the industry. Job Contexts set out the competences, qualifications and training standards for each role.

Each Job Context consists of a family of 5 job roles at varying levels, fifteen job roles have been developed so far.

Job Context families developed to date are Decommissioning, Radiation Protection, Process Operations and Nuclear Maintenance.



### Role Level 4 Health Physicist

Skill area	Knowledge and behaviours	Qualifications and training standards
Technical Competence	<ul style="list-style-type: none"> <li>• Deliver a radiation protection monitoring service to defined standards</li> <li>• Identify and quantify radiation hazards and supervise radiation protection monitoring activities</li> <li>• Conduct radiation protection monitoring</li> <li>• Respond to changes in radiological conditions</li> <li>• Deliver radiation protection training</li> </ul>	Relevant Honours or Foundation Degree. Training Standards in: <ul style="list-style-type: none"> <li>• Radiological Protection</li> <li>• UK Legislation/International Recommendations</li> <li>• Protection against External Radiation Sources</li> <li>• Protection against Internal Radiation Sources</li> </ul>
Business Improvement	<ul style="list-style-type: none"> <li>• Understand the theory, principles and practice associated with a variety of appropriate business improvement techniques</li> <li>• Solve process problems using business improvement techniques</li> </ul>	<i>Optional</i> Level 2 Diploma in Business Improvement
Compliance	<ul style="list-style-type: none"> <li>• Safety, security expectations on nuclear sites</li> <li>• Principles and implications of radiation hazards</li> <li>• Procedures for radioactive discharge, waste, environmental control, and emergencies</li> <li>• Safety management systems e.g. Permit to Work, SOPs and Risk Assessments</li> <li>• Company policy, legislation and regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Basic Common Induction Standard</li> <li>• Basic NI Behavioural training</li> <li>• Basic NI Context Training Standard</li> <li>• Managing Safely Training Standard</li> </ul>
Functional and behavioural	<ul style="list-style-type: none"> <li>• Team working and personal development</li> <li>• Develop and implement operational plans</li> <li>• Take responsibility for completing tasks and procedures</li> <li>• Communicate complex information</li> <li>• Coach others</li> </ul>	<i>Optional</i> Level 3 ILM Award in First Line Management

## Skills Match

This new web tool is now available via the Cogent website. There are two routes through the tool: the individual route where you can benchmark your qualifications against industry standard job roles and the employer route where companies can compare their competence profile against the industry standard and find further information about relevant qualifications and training standards.

[www.cogent-skillsmatch.com](http://www.cogent-skillsmatch.com)

## Competence Assurance

In a highly regulated industry the ability to demonstrate workforce competence for example, to the regulator is critical. The nuclear industry uses SQEP and Cogent is working with employers to develop principles for expressing the 'E' of SQEP that align with Job Contexts and the Skills Passport and provides companies with a self-check on the competence assurance systems in place.

“Through its partnering approach with the nuclear sector Cogent has developed world class standards for the industry. These employer endorsed Job Contexts will provide the platform for developing solutions to ensure industry-wide standards meet the needs of the sector.”

John Male, Head of Learning, Organisation & Capability Development, AMEC Power and Process Division



## We are working to

### Develop

With industry, develop the competences for the agreed range of Job Contexts, through the Job Context Development programme.

### Create

Create new Job Contexts for Safety Case Specialists; Construction and Project Management.

### Revise

We are revising the Competence Assurance tool to meet the requirements of all the nuclear industry.

### Roll-out

We are currently launching our Skills Match tool to the industry to support employers seeking a framework for Continuing Professional Development (CPD) and for individuals planning to gain new skills. [www.cogent-skillsmatch.com](http://www.cogent-skillsmatch.com)

# 3

## Cogent Apprenticeships

Apprenticeships provide the vital supply of skilled employees for the future and we are working to ensure sufficient numbers, with the right skills to meet the future needs. A key way of ensuring an adequate supply of skilled people, both in Site Licensed Companies and the into supply chain, is through community apprenticeship schemes. One such successful scheme is currently being managed by the Skills Academy, and funded by the Nuclear Decommissioning Authority (NDA).

Cogent's work on apprenticeships is reflected in the significant increase in the take-up of sector apprenticeships. Between 2005 and 2009 there has been 48% increase in registrations on the Cogent apprenticeship framework and a 13% increase in registrations across all main apprenticeship frameworks used within the Cogent industries.

## We have delivered

### Apprenticeship Expansion Programme

We've engaged with employers and providers to pilot a ground-breaking Learning and Skills Council (now the Skills Funding Agency) match-funded Apprenticeship Expansion Programme, which has seen 46 additional apprentices being taken on.

### Energy Skills Foundation

Sixteen young people also embarked on the new Energy Skills Foundation Programme at Lowestoft College. This pre-apprentice course is the result of a three year £100k project led by Cogent, ECITB, Skills for Energy and Lowestoft College. The course is training young people in practical engineering skill and it also covers the different industries in the energy sector, including nuclear.

### Radiation Protection

Cogent has added a new addition to its portfolio of Apprenticeship Frameworks for the nuclear industry – a new Radiation Protection Pathway. This is also the first Cogent Apprenticeship Framework to include one of the new qualifications designed for the Qualification and Credit Framework (QCF).

## We are working to

### Develop

We are working to ensure that both specialised and general apprenticeship frameworks are developed or updated and that they can be delivered flexibly to meet the needs of large and small employers.

### Evaluate

We will continue to evaluate the need for and requirements of a Higher Apprenticeship to bridge the gap between Level 3 Advanced Apprenticeships and Graduate entry.

### Assess

We will identify the need for Community Apprenticeship Schemes using our sound Labour Market Information (LMI).

### Ensure

We will ensure apprenticeship frameworks contain safety behavioural and attitudinal training modules as these are developed.



Cogent's *Future Skills* research programme is providing the essential intelligence to inform future skills needs. Reliable Labour Market Intelligence is necessary to develop valued education, training or recruitment interventions. Resource to develop standards and qualifications must be based on knowledge of the current and future requirements of the industry.

## We have delivered

### Nuclear Renaissance Series

We have embarked upon a series of four *Nuclear Renaissance* reports and have launched two of these *Power People* and *Next Generation*. This most recent report has required extensive collaboration and the partner organisations have been brought together by the National Skills Academy for Nuclear and Cogent. The

research is supported by the Office for Nuclear Development. The next two in the series are *Assurance: Skills for Nuclear Defence* and *Illuminations: Future Skills for Nuclear*.

Prior to these research reports the nuclear industry workforce had been estimated from limited secondary data which hampered future skills projections. This series returns us to full manpower data.

### Cogent Skills Oracle

The Cogent Skills Oracle is a unique benchmarking tool. It is using a barometer sample of 200 companies in the Cogent Sector, providing comprehensive coverage across all the Cogent industries and all sizes of organisations. The Skills Oracle is providing primary data on nuclear industry skills and is generating trend data, valuable in assessing future skills demand.

## Headline Findings

### Nuclear Renaissance

- The industry needs a 1000 apprentices and 400 graduates every year if the current level of power generation is to be maintained to 2025 and beyond (New Build).
- Without new build, the UK faces a reduction of 90% in the workforce employed in electricity generation.
- New build on a global scale would require between 110,000-140,000 person years of skilled nuclear work.
- UK can lead global nuclear renaissance with over 44,000 people currently working in the civil nuclear industry and with 50 years of nuclear experience.
- Workforce mobility is a critical factor in complex and multi-site engineering schemes. The Skills Academy's Nuclear Skills Passport is the solution to managing this.

### Skills Oracle

- Annual average company turnover in employment is approximately 13%.
- 75% of nuclear employers report professional scientists and engineers vacancies are 'hard to fill'.
- Annual training budgets average £1,160 per employee.
- Nuclear employers were satisfied with the coverage of qualifications across the sector.
- Technical training was the most frequently reported training undertaken, when viewed across both internal and external training requirements.
- 93% of nuclear employers use 'Private Training' providers; 87% use 'FE' providers; and 87% use 'HE' providers.
- For private training providers, satisfaction levels tended to be extremely high.
- The satisfaction ratings for FE and HE were also very high (ranging between 75% and 95%).
- The majority of nuclear employers (90%) place a high level of importance on the supply of Apprentices and Graduates to their workforce.

## We are working to

### Undertake

We will continue to undertake LMI against a range of scenarios reflecting current operations, new civil build and the defence nuclear programmes.

### Analyse

We will analyse our LMI and ensure that this is fed back into the Cogent Nuclear Industry Strategic Plan so that the research informs our action.

### Increase

We will seek to increase the number of nuclear employers taking part in Skills Oracle, who will each get their own bespoke company report with individual company benchmarking.



# 5

## Cogent Career Pathways

### We have delivered

#### Cogent Career Pathways

Our flagship careers resource, [www.cogent-careers.com](http://www.cogent-careers.com) is the established reference point for careers in the Sector. The website provides detailed information, advice and guidance on career progression, jobs, training and salaries in the nuclear industry.

Cogent focuses at a high level to ensure that the Cogent footprint, including the nuclear industry, gets visibility within the national and regional Science, Technology, Environment and Maths (STEM) agendas, rather than duplicating initiatives ongoing elsewhere. The Cogent Career Pathways website is targeted at students, teachers, career information officers and individuals within the industry as well as those from other industries considering a career change.

The Cogent career pathways site is used by many organisations with a jobs and careers guidance remit, and a recent survey showed that the resource is used by a third of all careers advisors.



### We are working to

#### Develop

We are working with employers to develop Job Context roles and will use these roles as the core of the nuclear career pathway.

#### Update

We will annually update Career Pathways information, to include the role profile details developed within the Job Contexts, job locations, salary information and “real life” case studies.

#### Invite

We will invite employers to place company profiles, with a view to linking to vacancies.

#### Monitor

We will monitor the website use by industry, schools and other stakeholders and evaluate its value with the customer base on a regular basis.

#### Conduct

We will conduct Labour Market Intelligence around STEM issues, including our regular surveys of students, teachers and career advisors to ensure that Career Pathways remains current.

## The National Skills Academy for Nuclear

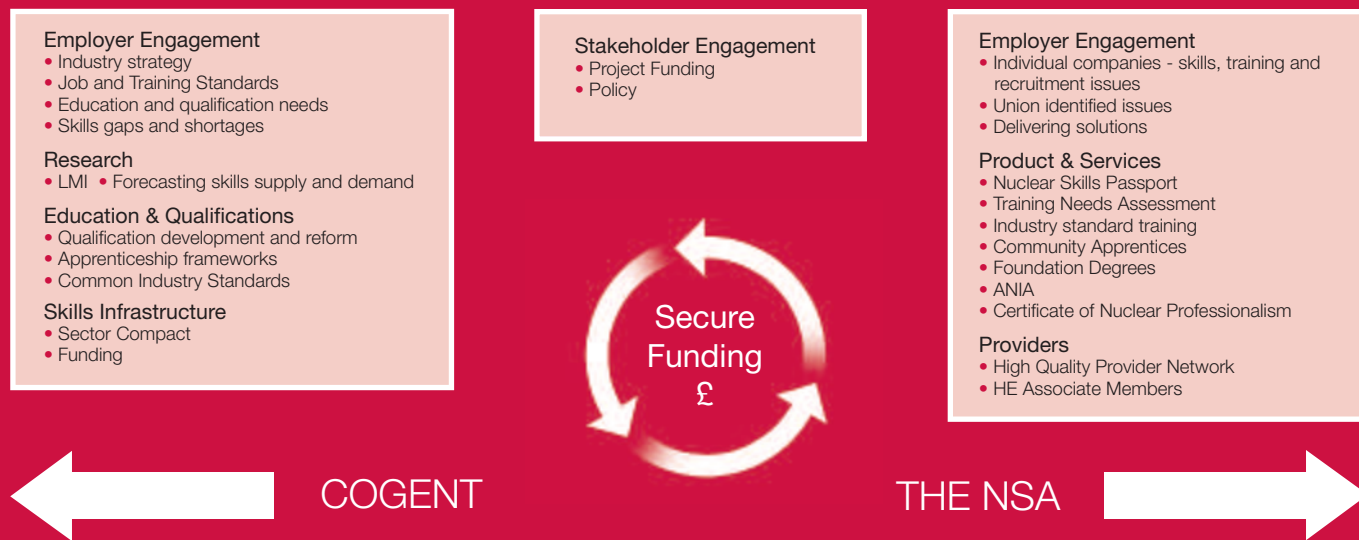
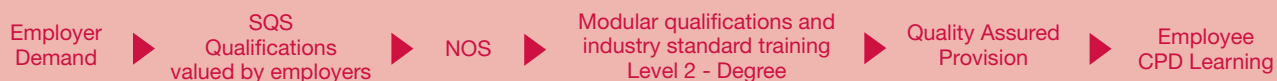
The Skills Academy is transforming skills development for the nuclear industry. It is giving employers a unique opportunity to shape training as well delivering products that work right across the Sector, ensuring transferable 21st Century skills.

It has developed a bespoke model that reflects the needs of the employers in the sector. Underpinning all of this is a network of quality-assured providers who provide training and qualifications based on Cogent standards.

Cogent works in close partnership with the Skills Academy developing and quality assuring vocational training.

As the value chain shows, Cogent is developing strategic skills action plans, undertaking research, developing qualifications, setting standards and representing the employer voice. At the other side National Skills Academies undertake regional employer engagement and deliver skills solutions to meet their needs.

# Value Chain for Cogent and Academies



## Key Skills Academy Developments

### Skills Passport

One of the Skills Academy's main priorities has been the development of the Nuclear Skills Passport which is on target for roll out 2010. The Nuclear Skills Passport is a system which offers all nuclear organisations instant secure web access to information on their nuclear skills base, offering a detailed overview of the training completed by their workforce as well as contracting organisations. The Nuclear Skills Passport provides a simple, highly secure method of aiding in the demonstration of SQEP and for contractors enables a mobile workforce with demonstrable transferable skills.

[www.nuclearskillspassport.co.uk](http://www.nuclearskillspassport.co.uk)

### E-learning Award for Nuclear Industry Awareness

The Award for Nuclear Industry Awareness has been designed with Cogent SSC and industry involvement to provide people who are embarking on a career in the nuclear sector with a foundation level of understanding of the industry. The Award marks a first for the Skills Academy, as it is the first e-Learning package to be developed.

### The Certificate of Nuclear Professionalism

This is a flexible post graduate qualification supporting professional development of the nuclear industry workforce. It is being developed and managed by the National Skills Academy for Nuclear through an employer steering group and designed in partnership the Open University, with input from Cogent's Higher Education team.

[www.nuclear.nsacademy.co.uk/products-and-services](http://www.nuclear.nsacademy.co.uk/products-and-services)

## Nuclear Employers Steering Group

Employers and stakeholders play a key role in our delivery, with the Nuclear Employers Steering Group and the Nuclear Advisory Council guiding our strategy and reviewing our progress.

NESG membership includes:

- AMEC
- Babcock Nuclear Services
- British Energy
- Department of Environment and Climate Change (DECC)/Office for Nuclear Development
- Magnox Electric
- Ministry of Defence
- National Skills Academy for Nuclear
- Nuclear Decommissioning Authority
- Sellafield Ltd
- Westinghouse Springfields Fuels Ltd

In addition we are supported by the Nuclear Advisory Council (NAC)

The NAC provides advice to both Cogent and the National Skills Academy and membership is open to all nuclear industry stakeholders

## Contact Us

**Cogent enquiries:**

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E: [info@cogent-ssc.com](mailto:info@cogent-ssc.com)

[www.cogent-ssc.com](http://www.cogent-ssc.com)

Cogent SSC, Unit 5, Mandarin Court  
Warrington WA1 1GG

**For information on undertaking a Cogent qualification or training contact:**

T: 01900 898 120

E: [enquiries@nuclear.nsacademy.co.uk](mailto:enquiries@nuclear.nsacademy.co.uk)

[www.nuclear.nsacademy.co.uk](http://www.nuclear.nsacademy.co.uk)



## Cogent is also supported by:

Ian Hudson, Nuclear Decommissioning Authority, (NDA)  
Cogent Board Member

David Barber, British Energy  
Cogent Board Member

Clive Smith OBE, Skills Development Director and  
Nuclear Industry Lead  
Cogent SSC  
[clive.smith@cogent-ssc.com](mailto:clive.smith@cogent-ssc.com)

## Key partners of Cogent and the Skills Academy include:

### Nuclear Industry Association:

The Nuclear Industry Association is the trade association and information body for the UK civil nuclear industry, representing over 160 companies and some 40,000 UK nuclear workers, including the operators of the nuclear power stations, those engaged in decommissioning, waste management, nuclear liabilities management and all aspects of the nuclear fuel cycle.

Cogent, The National Skills Academy for Nuclear and the Nuclear Industry Association (NIA) have recently signed a Memorandum of Understanding to support the performance of the UK Nuclear Industry.

### Nuclear Decommissioning Authority (NDA):

The NDA is a non-departmental public body, established under the Energy Act 2004. It is responsible for the decommissioning and clean-up of the UK's civil public sector nuclear sites. Its sponsoring Government department is the Department for Energy and Climate Change (DECC).

### Energy Foresight:

Energy Foresight provides a set of education resources for Key Stage 4 (S3 upwards in Scotland) that present radioactivity and related issues and supporting the new science GCSE curriculum.

### The Nuclear Institute:

The Nuclear Institute was created in 2009 from the merger of the British Nuclear Energy Society and the Institution of Nuclear engineers who between them have been serving the industry from the late 1950's, not very long after the industry first came into being and Cogent and National Skills Academy for Nuclear are signing a Memorandum of Understanding to facilitate closer working for the benefit of the UK nuclear industry.

### The Institution of Mechanical Engineers (ImechE):

The Institution of Mechanical Engineers includes a Power Division which has three subcommittees, Fossil, Nuclear and Renewables, each of which reflects the activities associated with generating and utilising electrical power, using a particular source of energy.

### The Institution of Chemical Engineers (IChemE):

The Institution of Chemical Engineers (IChemE) is an international professional membership organisation for people who have an interest in and relevant experience in chemical engineering. IChemE's Nuclear Technology Subject Group provides a network and forum for the technical and professional development of chemical engineers working in the nuclear industry.