

# innovate

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## NNL Fuels New Centre of Excellence

NNL and The University of Manchester's Dalton Nuclear Institute hosted the launch recently of the new Nuclear Fuel Centre of Excellence (NFCE). NNL MD Paul Howarth and Dalton Director Professor Andrew Sherry (see also page 6) led the event at the University campus, which also featured the Government's Chief Scientific Advisor Sir Mark Walport, who officially opened the Centre.



From L-R: Paul Howarth, Andrew Sherry, Sir Mark Walport, NNL Fuel Cycle Solutions Director, Fiona Rayment and Tim Abram, Professor of Nuclear Fuel at Dalton.

Creation of the NFCE was a key feature of the nuclear fission facilities section in the Nuclear Industrial Strategy published by Government in 2013. NFCE creates an advanced fuel R&D capability based in established world-class facilities and strengthens existing activity across NNL and Dalton.

It's supported by £8M worth of funding from Government and work will mainly cover fuel manufacture and characterisation.

NFCE will support the creation of improved fuel for current reactors, the new build Generation III fleet, Small

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# NNL Fuels New Centre of Excellence *(continued from front page)*

Modular Reactors (SMRs) and ultimately Generation IV fast reactors.

## Nuclear Fuel Manufacture

The introduction of any new fuel or cladding requires fabrication routes that meet or exceed the stringent safety and quality standards of current materials and processes. Any new manufacturing technologies will be required to demonstrate these standards. NFCE will deploy a range of equipment for fuel fabrication development.

## Nuclear Fuel Characterisation

Also essential in the development of any new fuel or cladding, characterisation supports the evaluation of performance and safety. NFCE also has a range of equipment to examine microstructure, thermal and mechanical properties and interaction between the fuel, the cladding and coolant.



A virtual NFCE has been created with equipment based in four locations:

- NNL Central Laboratory
- NNL Preston Laboratory
- University of Manchester NFCE Laboratories
- Dalton Cumbrian Facility

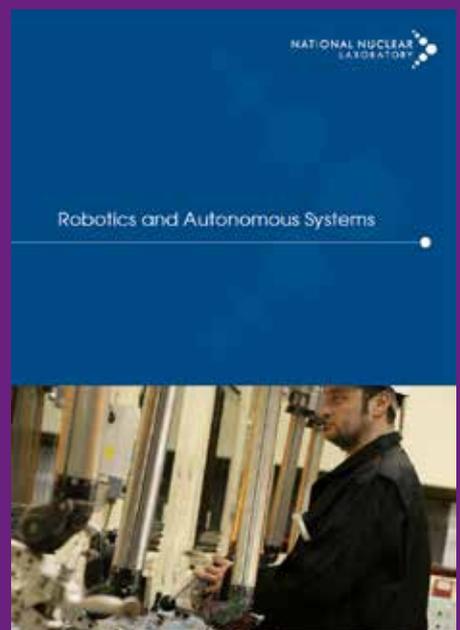
## Robotic and Autonomous Systems

Identified by the UK Government as one of the 'Eight Great Technologies', Robotics and Autonomous Systems (RAS) has great development potential for the future. In 2012, the UK Technology Strategy Board created the Robotics and Autonomous Systems Special Interest Group (RAS-SIG).

Its mission has been to understand the nature of the landscape and the opportunity for RAS in the UK, to connect fragmented communities of researchers, industrialists and civil servants and to produce a national strategy to inform future Government resourcing and organisation. NNL has a long track record in

robotics and autonomous systems and is a specialist contributor to the design, development and testing of robotic solutions in remote and hazardous environments.

A new brochure has been published by NNL covering its RAS services. The brochure outlines the six Technology Demonstrators for which NNL is searching for collaborators. It's available to view in full via the NNL website at [www.nnl.co.uk/ras](http://www.nnl.co.uk/ras)



# QA

with Dave Ritson, Business Manager for the Reactor Chemistry and Corrosion team



## What does your job involve?

I'm a Business Manager in the Reactor Chemistry and Materials (RCM) group of the NNL Reactor Operations Support (ROS) Business Directorate. Now there's a mouthful...!

I see my role as having three main focus areas - business delivery, business growth and people leadership. I lead a team of seven scientists covering a wide range of technical disciplines including corrosion and related matters, reactor water chemistry and modelling. We have longstanding and well respected relationships with existing key customers such as EDF Energy, the Electric Power Research Institute (EPRI), Magnox Limited and the Nuclear Decommissioning Authority (NDA).

I see RCM as having huge growth potential going forward, assisting regulators and vendors through the Generic Design Assessment (GDA) of new build reactor types and Small Modular Reactors (SMRs). I also see collaborations in Asia with nuclear vendors as a great opportunity. It's an exciting time and the job of a Business Manager is extremely varied with new challenges every day.

## How long have you been in the nuclear industry (or with NNL)?

I've had a bit of a sandwiched career in the nuclear industry so far. After finishing my PhD in Electrochemistry and Nanotechnology from the University of Liverpool, I started as a Materials Scientist/Chemistry graduate

at Serco TSC (now AMEC) based in Warrington.

My role was specifically looking at irradiation effects on Zirconium Cladding of Pressurised Water Reactors (PWRs) and developing and implementing large scale non-irradiated corrosion test programmes. I also supported the provision of Independent Nuclear Safety Advice (INSA) to Rolls Royce and the Ministry of Defence.

I was at Serco/AMEC for just over three years before I took a career tangent and moved to Cheltenham to become a lead scientist for a company supplying technically advanced nonwovens for engine, high efficiency and liquid filtration applications.

This job took me all over the world and allowed me to develop skills such as 'Lean Six Sigma Methodologies' as well as being extremely customer focused. I worked in this role for four years before being tempted back into the nuclear sector with NNL. I've been in my current role for just over three months.

## How did you come to be doing the job you have now?

My time at Serco/AMEC helped me develop a real affection for the nuclear industry. The work I undertook was technically challenging and very varied and the outcome of the research had genuine world applications. But, I've always been a people person and crave new challenges. So, when the opportunity

arose in NNL to develop my leadership skills as a Business Manager, I jumped at the chance. I was obviously aware of the transformation NNL was going through as a national laboratory and the fit seemed right. Being a manager is certainly challenging but equally, it's very rewarding.

## What do you hope to be doing in five years-time?

I would like to see that the foundations of my team's efforts and hard work have been built upon and the breadth and depth of knowledge and expertise expanded. This will be key to meeting the demands of an ever growing nuclear industry. Personally, I'm looking forward to guiding the team through this period of growth.

## What does working at NNL mean to you?

It's a sense of being part of something really important. The UK nuclear industry has been going through something of a renaissance in recent years and the importance of continued investment in R&D and the development of new expertise is paramount to the sustained future of nuclear power generation. NNL is pivotal in this journey.

## What aspects of your job do you like the most and the least?

I've only been in post a few months but already I've had the opportunity meet with a diverse range of people, from new and existing customers to

experts from within NNL. Helping and mentoring early career workers to develop both technically and personally is another great aspect of the job and hopefully passing on some words of wisdom in the process.

It's always a challenge when you join any new organisation. Being so new in post, you're met with a great number of challenges from the word go. If you couple this with the extra regulation and structured way NNL and the nuclear industry as a whole operates then it can be a challenge to adjust. However, I have a great team behind me to support me along the journey.

### **Tell us something about yourself that people may not know ...**

I learned how to unicycle and juggle (alas, not at the same time...!) at University. I have my own unicycle at home. I admit to getting some funny looks in the summer when I take it to the park for a ride. I'm also in a band where I play bass guitar and we're called 'Five Man Fix'. Check us out on Facebook - we're available for weddings, birthdays, funerals...

### **Who or what is has been a big influence on your career journey?**

In every job I've had so far, I've been extremely lucky to have had a great support network. I see this as vital to career development and often the best bits of advice you get are from an informal chat over a coffee or lunch. I've always been very career driven but undoubtedly I couldn't have achieved what I have so far without the support and guidance of my family.

### **What advice would you give to someone thinking of joining the nuclear industry?**

That's a no brainer... apply now! I don't think any other career offers such a variety of opportunities and can be such an exciting job for life.

### **What do you do to relax outside of work?**

Music has always been a real passion of mine. As well as being in a band, I write and record my own music and used to DJ at house and techno in clubs and bars around Manchester and Liverpool. I'm very much a bedroom DJ now but I still enjoy it and love discovering new music. I'm also a bit of a gym addict and go four or five times a week.

### **What is the first thing you pack to take with you when you travel away from home?**

My iPad! Continuing the same theme, the music making apps you can buy are of incredible quality so if I get a moment of inspiration while travelling I can record it there and then. I can't wait to see how this technology develops in the future.

### **What famous figure would you most like to meet?**

It'd have to be Frankie Knuckles. He's pretty much been the godfather of modern dance music and was a pioneer way ahead of his time. Sadly, he passed away earlier this year.

## NNL and Liverpool Agree Strategic Partnership

Building links with the academic community is a major driver for NNL and strong links with Universities are being established in the UK.

NNL has announced a strategic partnership with the University of Liverpool aimed at developing international research on nuclear power generation. The partnership will focus on work across engineering, environmental sciences, electrical engineering, electronics and the computer and physical sciences.

NNL MD Paul Howarth said: "There are significant benefits to both parties when an industry-university relationship moves from being transactional to truly strategic.

"I'm pleased to have progressed NNL's relationship with Liverpool to a higher level and to be able to engage with such a wide range of subject areas."

Plans for the future of the partnership include education activities and a series of joint appointments.



Above: Steve Holloway (Liverpool University) and Paul Howarth (NNL) sign the agreement.

# New Faces Join NNL Board

Energy and Climate Change Minister, Baroness Verma has announced the appointments of three new Non-Executive Directors for NNL. They are Sir Andrew Mathews, Dr Mike Weightman and Iain Lanaghan.

In making her announcement, Baroness Verma said: "As the UK's nuclear industry grows in importance, NNL's work in supporting organisations across the sector is taking on increasing importance.

"With these appointments we are bringing an exceptional blend of expertise, ability and experience to NNL's Board and I am sure that the new Non-Executive Directors will make very valuable contributions as NNL continues to develop as a true national laboratory."

NNL Chairman Richard Maudslay added: "I am delighted to welcome the three new Non-Executive Directors to the NNL Board. I would also like to pay tribute to our former non-Executives, Ian Smale and Peter Jones, who both made superb contributions through a period of vital change for the organisation."

**Sir Andrew Mathews** recently retired from a lengthy and distinguished career in the Royal Navy. He is a nuclear engineer and served most recently as Chief of Materiel (Fleet) with responsibilities including the acquisition and support of all Royal Navy ships and submarines and the management of the Royal Navy's three naval bases. His previous post was as Director General Nuclear and Director General Submarines.

**Mike Weightman** also recently retired as HM Chief Inspector of Nuclear Installations and Chief Executive of the Office for Nuclear Regulation. Mike is



a distinguished former regulator with exceptional knowledge of the UK's nuclear sector. In 2011 he led the International Atomic Energy Agency's independent fact-finding mission to Japan following the earthquake and tsunami and its impact on the Fukushima Dai-ichi nuclear power station. He is Visiting Professor in Nuclear Energy at the University of Cambridge's Department of Engineering.

**Iain Lanaghan** is a Chartered Accountant having qualified with KPMG in London and has an MA in Economics and Accounting from the University of Edinburgh. He is a former Finance Director and Chief Financial Officer of a variety of firms including FirstGroup plc and most recently Faroe Petroleum plc. Iain has extensive experience across the upstream oil and gas and transport sectors. His international work experience has included periods in Germany and Spain.

Also joining the NNL Board is new People Director **Jilly Atherton**, who will also be part of the NNL Executive team. She has extensive strategic and operational HR leadership experience



in diverse industry sectors including aviation, oil and gas, manufacturing, recycling and customer service. Her previous employers include British Airways, Trelleborg and SAICA.

Jilly's position on the Board further emphasises the importance that NNL attaches to its people. She will be responsible for helping to shape and deliver NNL's 'people agenda', which includes communication and engagement, culture and values, reward, industrial relations and strategic change projects.



**Liane White** has taken up the new role of Talent and Development Director sitting on the NNL Executive team. She has extensive experience in the nuclear industry across the HR function and Learning and Development. She is an experienced professional with a long track record in the nuclear industry joining NNL's predecessor organisation in 1996.

Liane led the development of the strategy for the deployment of an effective People Services function in the current NNL business. She is passionate about personal development and was instrumental in creating the NNL Leadership Development programme. Liane's new role reinforces the commitment to supporting people with their development and career progression and moves NNL closer to its goal of becoming an employer of choice.

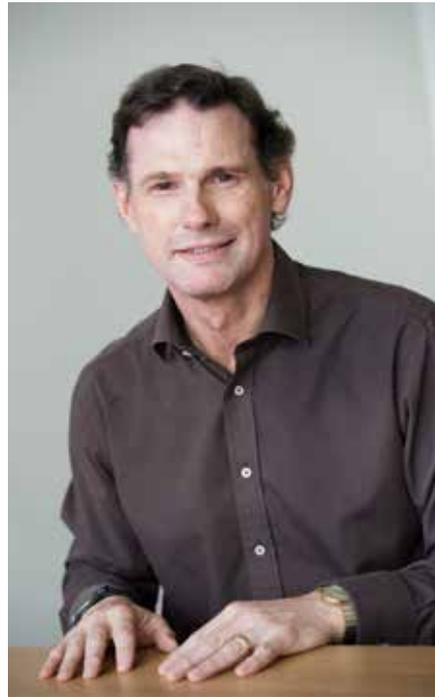
# Andrew Sherry to Join NNL

NNL's current Chief Science and Technology Officer (CSTO) Graham Fairhall is approaching his well-earned retirement after a long and successful career in the industry. Graham will leave NNL at the end of March next year.

NNL has announced that Professor Andrew Sherry will be Graham's successor as CSTO. Andrew is currently Director of The University of Manchester's Dalton Nuclear Institute. His extensive previous experience includes a spell as Director of The University's Materials Performance Centre.

He has also held a Royal Society Industry Fellowship and was a Senior Consultant in the nuclear industry working in the field of materials and structural integrity. He is a Fellow of the Royal Academy of Engineering, a Fellow of the Institute of Materials, Minerals and Mining and a Chartered Engineer.

During his most recent role, Andrew led the establishment of the innovative Dalton Cumbrian Facility. DCF is a partnership with the Nuclear Decommissioning Authority (NDA) and has created a new centre of excellence in radiation science and engineering decommissioning



research. NNL holds strong links with DCF and the two organisations are pioneering academic access to facilities at the Central and Workington Laboratories.

NNL and DCF are exploring opportunities to collaborate and both organisations are core contributors to the new National Nuclear Users Facility, announced as part of the UK Government's Nuclear Industrial Strategy. Andrew's arrival at NNL will lead to an ongoing strengthening of the partnership.

Other career highlights include the leading of a new collaboration between the Universities of Manchester

and Sheffield to create the Nuclear Advanced Manufacturing Research Centre. He is also Programme Director for the £8 million 'New Nuclear Manufacturing' research package funded by the Engineering and Physical Sciences Research Council (EPSRC), the Universities of Manchester and Sheffield and Rolls-Royce.

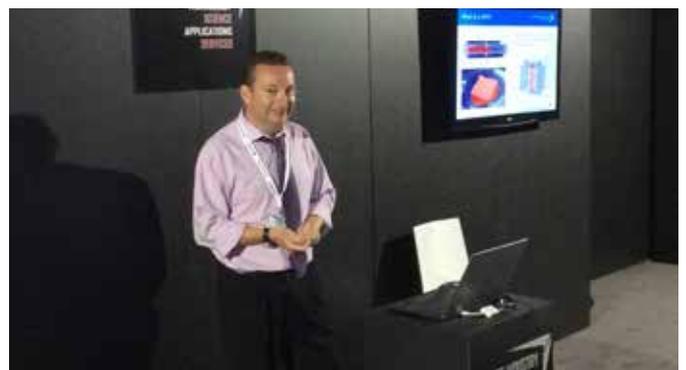
Andrew is already familiar with many NNL people having worked very closely together during his 17 years associated with the nuclear industry, especially through his decade at The University of Manchester.

Commenting on Andrew's appointment, NNL MD Paul Howarth said: "We have been fortunate to have Graham Fairhall as part of our Executive team in NNL and there are few senior figures in the sector who could begin to step into his shoes.

"Fortunately, Andrew is pre-eminent among those few and we're delighted that he has agreed to become the latest in a succession of leading figures joining NNL in one capacity or other."

Andrew commented: "I look forward to working with the excellent NNL staff and all academic and industrial partners to ensure NNL has the capability it needs to deliver scientific excellence and innovation."

Andrew will join NNL in January and will transition fully into the CSTO role working closely with Graham Fairhall.



# Agreement with China

NNL has signed a ground breaking agreement with the China National Nuclear Corporation (CNNC). Under the terms of the Memorandum of Understanding (MOU), NNL and CNNC will explore areas for mutually beneficial collaboration in a wide variety of nuclear fuel cycle sectors.

Key areas include advanced reactor and fuels technology, virtual engineering, advanced reprocessing/recycling, nuclear waste management, decommissioning and nuclear materials analysis.

Collaborative activities may take many forms including technical exchanges, seminars, workshops, lectures, training of personnel, PhD partnering, personnel exchange/secondment, joint R&D programmes, technical support and consultations.

Former UK Government Minister for Energy and Business Michael Fallon said: "This deal brings a real boost to the UK economy. Closer co-operation between the UK and China could be worth hundreds of millions of pounds to British businesses. We are making the most of Britain's low carbon energy to maximise jobs and business opportunities, get



*Richard Maudslay (right) signing the agreement on behalf of NNL*

the best deal for customers and reduce our reliance on expensive foreign oil and gas imports."

NNL Chairman Richard Maudslay, who signed the agreement for NNL, said: "I am delighted to sign this agreement on behalf of NNL. China is a growing force in the global nuclear sector and we are pleased today to be strengthening our relationship with the Chinese through this R&D agreement with CNNC. I have no doubt that we will identify many productive areas for collaboration as we work together over the coming months."

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## NNL Flies into Farnborough

Every two years, Farnborough in Hampshire hosts the world famous International Airshow that celebrates all that's best in international aviation. This year, NNL joined in the celebrations and took part in an exhibition run by the UK Space Agency.

Farnborough is a week-long event that combines a major trade exhibition for the aerospace and defence industries with the public airshow. NNL maintained a constant presence throughout the week including trade and public days.

The airshow is an important event in the international aviation calendar, providing an opportunity to demonstrate civilian and military aircraft to potential customers and investors. The show is also used for the announcement of new developments and deals. It attracts national and trade media coverage.

NNL was part of the 'Space Zone', which featured exhibits from the UK and European Space Agencies. The NNL exhibition featured work being carried out to demonstrate the feasibility of using americium in a Radioactive Thermoelectric Generator (RTG) or 'space battery' to power future generations of European led space missions.

NNL Business Leader Tim Tinsley led a well-received Space Zone Seminar on 'The Role of Nuclear Systems to Provide Heat and Power in Space'. Tim's seminar covered both historic achievements and future developments. Tim and Keith Stephenson, from the European Space Agency (ESA), were also interviewed by World Nuclear News.

NNL's exhibition generated a lot of interest from visitors during the event. The contribution to space exploration and the NNL business more generally were popular areas for discussion.

*Opposite: Tim Tinsley presenting at the Farnborough International Airshow*

# New Chapter for Windscale Laboratory

Work to empty canned fuel from the first spent fuel storage pond at Sellafield has restarted following a successful programme to refurbish NNL's specialist Windscale Laboratory.

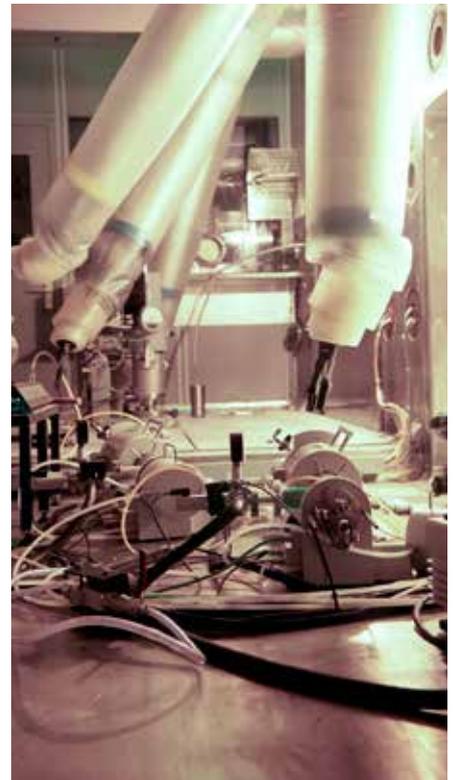
The facility repackages legacy fuel into modern containers. This involves opening up the old fuel cans in a controlled environment to examine the fuel condition and then repackaging it for transfer to the site's more modern fuel storage facilities.

The Windscale Laboratory is a high-active facility, offering a range of services including the post irradiation examination of nuclear fuel, radioactive waste processing and management as well as material analysis and mechanical testing.

The refurbishment has seen a major import/export section of the plant thoroughly modernised to ensure it can safely manage historic fuel. In addition, a new crane has been commissioned to enable efficient operations for the remaining operational life of the facility.

The Pile Fuel Storage Pond (PFSP) was the very first nuclear fuel storage facility constructed at Sellafield back in the 1940s and to this day remains the largest open air nuclear storage pond in the world. It is currently being decommissioned and part of this work involves emptying the inventory of nuclear fuel.

Originally, PFSP stored nuclear fuel and isotopes from the Windscale reactors that produced nuclear materials for the defence industry. However, the majority of this canned fuel actually hails from the Windscale Advanced Gas Cooled Reactor (WAGR) - the former test reactor. The PFSP received fuel from WAGR in the 1960s.



NNL's Waste Management and Decommissioning Director Nick Hanigan said: "NNL's Windscale Laboratory is strategically important to both Sellafield and the UK. Sellafield Ltd is NNL's biggest customer and it's very important that we work together on the legacy clean-up of the site.

"I'd like to take this opportunity to thank all of the Sellafield Ltd team involved in recommencing the processing of materials and also the NNL team. They worked closely together to make this project a success. It is a major step forward in decommissioning the PFSP."

## NNL Website - Take a New Look

Did you know the NNL website has been redesigned with improved features and content? Why not take a look at [www.nnl.co.uk](http://www.nnl.co.uk).

As the industry continues to evolve, NNL has refreshed and sharpened its identity and the way we present ourselves to customers and other stakeholders.

This includes the new website. It looks different and contains a wealth of new material about NNL, our work and our people. The site has been

specifically designed to work on a range of mobile devices. The homepage features a tour of our key facility, the Central Laboratory featuring 360° photography and process animations in both the alpha and highly active laboratories.



# Ten Great VTR Years

Located adjacent to NNL's Central Laboratory, the Vitrification Test Rig (VTR) is a full scale replica of the Sellafield Waste Vitrification Plant (WVP) process. The WVP treats high level waste on the Sellafield site prior to storage as a glass based product in a dedicated product store.

This year, the NNL VTR team is celebrating a decade of successful support to WVP. An NNL/Sellafield Ltd celebratory event has taken place to commemorate the support provided throughout the operating life of VTR.

people we have in our laboratories and of the strong partnership between them and our Sellafield Ltd customers.

"This partnership has over the years solved many technical problems and come up with innovative solutions to issues that are often unique by their very nature.

"We were delighted to have the opportunity to thank both the teams for

their commitment to the project and to recognise the level of expertise that they hold."

regulator expectations of reducing High Active Liquor (HAL) stocks. I was delighted to go along and pass on my congratulations to all involved."

Adding his congratulations, Jamie Reed said: "Innovation is a necessary element, particularly as we move forward into post-operative clean out at the site. Organisations will be required to work together more and more and this is a clear example of how that collaboration really works well. I was very happy to show my appreciation and support by attending this event."

Services provided by VTR include calcination, glass production and examination of the primary off-gas system in WVP. The objective is to support WVP in making improvements to the plant. In addition, NNL provides experts to assist with the implementation of improvements to WVP providing a smooth transition from research to implementation.



Above: Jamie Reed MP and Graham Fairhall at the Celebration Event

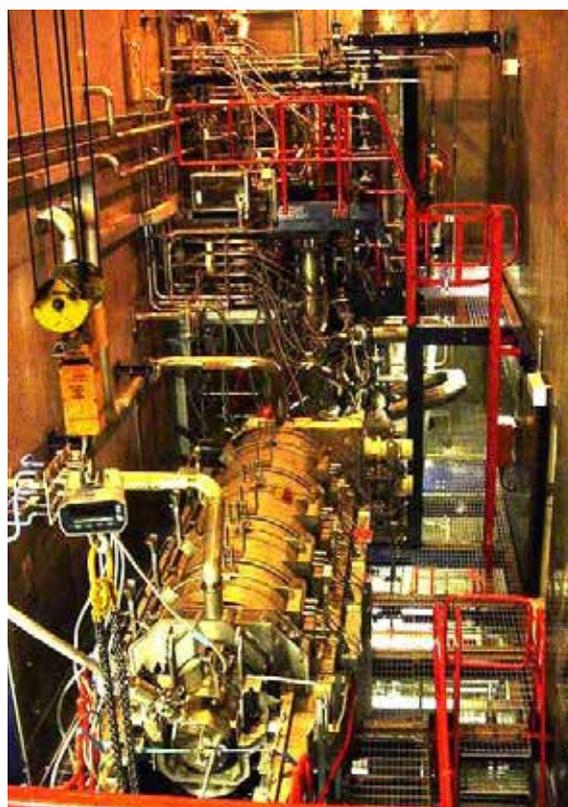
The informal get together took place at The Beacon museum in Whitehaven harbour and was an opportunity to provide many local stakeholders with an appreciation of the important role that VTR has played over the years and the ongoing support that it will continue to provide to WVP.

Chief Science and Technology Officer Graham Fairhall hosted the celebrations on behalf of NNL. Gilles Perrier, the Waste and Effluent Disposition Director for Sellafield Ltd co-hosted. VTR Technical Manager Nick Gribble presented an overview of the facility, its history, successes and future plans and local MP Jamie Reed also made a short speech. Each guest received a commemorative brochure and a VTR timeline.

Graham Fairhall said: "We're proud of the many exceptionally talented

Gilles Perrier added: "I worked for many years on the French equivalent to the Sellafield Waste Vitrification Plant at La Hague and have the WVP within my current remit. I know only too well the issues and challenges the plants can present and the difficulties involved with finding solutions within a radioactive environment.

"The VTR has been invaluable in finding solutions to many issues over the years in a non-radiological environment, the teams on that project working together with Sellafield Ltd have ensured that solutions are put in place in a timely and safe manner and that Sellafield Ltd can meet



# New Links Boost

Over the past few months, NNL has been working to establish new formal links with a series of high quality organisations.

A new Memorandum of Understanding (MOU) is close to being finalised that will formalise arrangements between the Global Nuclear Skills Institute (GNSI) and the Emirates Nuclear Energy Corporation (ENEC).

GNSI is a joint venture between NNL and the British Institute of Technology and E-commerce (BITE). The organisation offers a global solution to the nuclear skills gap. ENEC's vision is to develop the future growth and prosperity of the United Arab Emirates (UAE) through a safe and sustainable nuclear energy programme.

Once agreement is reached, the new MOU will cover the strategic provision of education and training services to ENEC. This would be a landmark development in the relationship between the two organisations.

NNL has also been further developing links with Savannah River Nuclear Solutions (SRNS) in the USA and expects to agree a new Confidentiality Agreement (CA) soon. SRNS oversees the operation of the Savannah River National Laboratory (SRNL) on the extensive site in South Carolina. SRNL is involved in research on environmental remediation, handling of hazardous materials and the prevention of

nuclear proliferation. NNL has maintained close links with the national laboratories in the US over the years.

Once completed and agreed, the new CA will cover the exchange of proprietary information between NNL and SRNS leading to development of collaborative programmes of work. Initially this will be in high level waste management and the vitrification process and technology.

Following on from the successful signing of a Statement of Intent (SOI) in September, NNL is continuing to work closely with the US Department of Energy (USDOE). More specifically, NNL is working with the USDOE Office of Environmental Management (EM) and Office of Nuclear Energy (NE) to develop international programmes.

A high level party from EM and NE will visit NNL at the Sellafield site in February for a series of site tours and detailed technical discussions. EM and NE are particularly interested in the deployment of pulse jet mixer technology at Sellafield and how this successful operating experience can be applied at the Hanford Site in Washington State USA. There will also be discussion about the possibility of using the NNL Vitrification Test Rig (VTR) to process simulated Hanford wastes.

# Last Graphite Campaign

A celebratory dinner held in Cumbria has highlighted the success of NNL's graphite measurement campaigns in support of the Wylfa and Oldbury Magnox power stations.

Over the years, NNL people have worked on the measurement programme that provides data to support operational safety cases for both stations. These have successfully proved the capability of both stations to be granted lifetime extensions. Graphite, a form of carbon, helps to control the speed of the nuclear reaction in a reactor and is a key component.

Oldbury in South Gloucestershire was originally designed for a 25 year operating life but continued to produce electricity for 44 years. Wylfa, located on the island of Anglesey, is expected to end generation in December 2015. With the station having come on line in 1971, it will also have generated power for 44 years. The reactors at Wylfa are the final Magnox design operating units in the UK.

The celebratory dinner held at Cockermouth featured nearly 30 guests including Wylfa Deputy Site Director Gordon Malcolm, NNL's Reactor Operations Services Director Charles Potter and Waste Management and

Decommissioning Director Nick Hanigan. NNL people who have worked on graphite measurements were also heavily represented from across all of the sites involved.

Each guest, around 50 in total including NNL people who couldn't make it to the dinner, received a special memento of the occasion. NNL's contribution was gratefully acknowledged as was the professionalism and dedication applied by the NNL team to such a successful and productive programme over the years.



# In the Media

**NNL has again attracted considerable interest from the media. We like to think this a sign that we are doing things right and presenting opinions that people find interesting. A selected highlight from our media coverage was an appearance on the BBC TV's 'Inside Out' programme.**

## ● Inside Out

Inside Out is a regional series with eleven variations nationally covering real-life stories and investigations.

NNL was featured in an item shown in two regions, the North West and North East/Cumbria. Presented by journalist Chris Jackson, the piece investigated the options available for managing the UK's stockpile of plutonium.

Filming took place at Sellafield inside and outside of NNL's Central Laboratory and featured an interview with Senior Research Fellow Dr Robin Taylor. Robin's area of expertise is actinide chemistry and his role covers applied technical advice to nuclear reprocessing and other plant. He also supports research on advanced nuclear fuel cycles. Senior Fellows are nationally and internationally known and respected in their fields and they act as technical leaders and ambassadors for NNL and the industry more generally.

Inside Out asked questions about whether plutonium should be used to manufacture nuclear fuel or continue to be stored? Mixed oxide fuel is made up of a combination of uranium and plutonium. Also interviewed for the item was Dr Adrian Simper, Strategy and Technology Director at the Nuclear Decommissioning Authority (NDA). Adrian was filmed in the Central Laboratory.

Chris Jackson also travelled to America to find out more about how the same issue is being managed at the Savannah River nuclear site where a new mixed oxide production plant is nearing completion.

The current preferred option for dealing with the UK's plutonium is to convert it into mixed oxide fuel. This means constructing a new mixed oxide fuel manufacturing facility at Sellafield. A new plant would be high cost but would be a boost to the West Cumbrian economy by creating many thousands of construction and operations jobs on the Sellafield site.

Government is expected to make a decision on plutonium disposition next year.

## The Times

NNL was also in the news recently with a full page profile feature in a special supplement of The Times newspaper across the North of England.

Under the headline 'Global Power for Innovation' the article highlighted several recent developments involving NNL. These included the Nuclear Fuel Centre of Excellence (NFCE) (Headline: Collaboration that's key to energy security) and the work carried out in the NNL Vitrification Test Rig (VTR) (Headline: A 'glass act' in safer storage) to support Sellafield operations.

Quoted in the article, MD Paul Howarth described the role of NNL: "We sit somewhere between fundamental research and nuclear operations," he said. "We have outstanding research facilities and attract some of the best and brightest minds to use them - including subject matter experts, chemists, physicists and mathematicians all engaged in leading research."

## Science Media Centre

Also strengthening NNL's media connections, External Relations Director Adrian Bull has been appointed to the Advisory Committee of the Science Media Centre. The SMC is the body which aims to ensure that the media have access to the most knowledgeable experts when science-based news stories hit the headlines.

The SMC works with journalists, scientists and press officers to make sure accuracy is assured when science is prominent in the media.

The Advisory Committee guides the Board of Trustees at SMC and is a voluntary group of advisors from across science, engineering, medicine, journalism and communications. The Committee meets three times a year.

# NNL People: Ravinder Sibia Procurement



**Effective management of procurement and supply is an essential contributor to the success of any organisation. This definitely applies to NNL as the business depends on the right goods and services being available to the right quality at the right price and at the right time to support efficient and profitable operations.**

NNL has been building a strong in-house Procurement team to make sure the business is supported in getting the best out of the supply chain while professionally managing any related risks. The team is made up of procurement professionals led by Ravinder Sibia.

"To operate at the right level to deliver for NNL we have to be quite versatile and have a strong appreciation of the business," said Ravinder. "Members of the team also need to have good communications skills and a flair for negotiating. We also look for people who can maintain a balance between being creative and having a good eye for detail."

## **Professionally Qualified**

The vast majority of the Procurement team are either professionally qualified or studying towards chartered status. "We have a good mix of seasoned professionals and younger people starting out in their careers," said Ravinder who has been with NNL Procurement since 2005.

"We already have a fully mapped out Procurement Plan with some key areas of NNL and we've made good progress," she added. "The team has been restructured over the past year to assign Procurement Leads to work closely with each of the NNL Business Directorates, Facilities and Functions."

Effective Procurement Plans mean better resource provision, improved service, leveraged expenditure and

delivery of enhanced frameworks, categories and rebates.

"We're building on our success so far and aiming to achieve proactive engagement across NNL with a defined year on year Procurement plan," said Ravinder. "We are also looking to drive more efficient processes such as e-procurement to make it easier for internal customers to buy from pre-approved catalogues."

## **Pass it Our Way**

The Procurement team become involved internally when NNL business purchases reach a threshold cost. "We're promoting a new strapline to act as a reminder 'If it's over £5K, pass it our way'," said Ravinder. "We're getting our message out throughout NNL so that we make sure we make the best possible deals with the supply chain," she said.

"We also want to establish better relationships with key suppliers and make NNL an attractive company to do business with. This means updating our systems, especially online, to simplify the processes for suppliers to make contact with us."

## **High Value and High Risk**

Looking forward, Ravinder is aiming to improve input from the Procurement team into the management of high value and high risk contracts. "It's important that we get the management of these contracts right," she said. "Procurement is about managing risk and failure to do so can

have severe financial and non-financial consequences, such as negative impact on reputation and also waste time dealing with claims.

"We're determined to move away from transactional functionality into deploying much greater engagement with the internal NNL customer and also the supplier. We aim to manage the process from issuing a comprehensive Invitation To Tender (ITT), placing a contract and then seeing work successfully delivered."

High risk contracts are not necessarily high value but still have a dramatic impact on the business if anything goes wrong. "We could be depending on an item of equipment being constantly available even though it's relatively low value to buy," said Ravinder. "These are business critical items and the Procurement team can provide support in mitigating these risks."

## **Teacher to Nuclear Buyer**

Ravinder's early career path was a far cry from NNL or the nuclear industry. She gained a degree in Business Studies at Kingston University and then completed a Post Graduate Certificate of Education (PGCE) at the University of Bristol. She took up a post at a comprehensive school in Peterborough teaching Business Studies to pupils up to sixth form.

She spent three years in teaching before deciding that opportunities for advancement were limited. "Like a lot of young people I was ambitious," she

said. "I decided to make a change and went back into full time education."

Returning to University, this time in Wolverhampton, Ravinder took a Master of Business Administration (MBA) course. During this period, she first came into contact with the nuclear industry. "I attended a careers fair at Aston University," she recalled. "A human resources team from British Nuclear Fuels plc (BNFL) was exhibiting and recommended I apply for a job."

She did so, was successful in her application and joined the BNFL graduate programme in 2001. Her first job was as a Graduate Business Analyst working in the Information Technology Department. She made immediate progress and was fast tracked off the two-year graduate programme into a permanent role after only eight months.

"I worked with a good group of people and was fortunate that my boss at the time supported and encouraged me," she said. "There were plenty of opportunities to get involved in interesting work."

In 2003 she joined BNFL Nuclear Science and Technology Services (NSTS) to work in the Strategy team. NSTS had evolved from the BNFL Research and Technology Division and subsequently formed the basis of the Nexia Solutions business in 2005, from which NNL was created in Government ownership in 2008. Ravinder spent her first two years in the business examining value

propositions for potential future projects.

In 2005, Nexia Solutions set up its own Procurement function and Ravinder joined the team. "Although I had no formal experience of procurement, I did have a business based background, which was useful. I also had a willingness to learn," she said.

### CIPS and Son

Settling in quickly, Ravinder was soon making a contribution in procurement and began taking steps to become qualified via the Chartered Institute of Purchasing and Supply (CIPS). "I'd recommend becoming professionally qualified if the opportunity is there," she said. "NNL has a very good track record in encouraging people to gain accreditation with the leading professional bodies."

Ravinder was preparing for her final exams when son Yuvraj was born in 2007. "That was a challenging period," she recalled. "Yuvraj was six months old when I took and passed my last exam in 2008."

Following maternity leave Ravinder returned to procurement and first led the team in 2010 on an acting basis before making the appointment permanent in 2011. "We've continued to develop the team and while people inevitably move on, we've established a strong core competence that enables new people to slot in and start contributing quickly," she said.

### Tennis, Spurs, United and Volunteering

Originally from Telford in Shropshire, Ravinder lives in Warrington. Her son Yuvraj is now seven years old. "He's football mad and a big Manchester United supporter," admitted Tottenham Hotspur fan Ravinder. "United are in a dip at the moment so he's experiencing disappointment for the first time just like us Spurs fans!"

Standing on the touchline in all weathers has become part of her weekly routine with Yuvraj starring as

goalkeeper for his local club Winwick Athletic. "Being a football fanatic, he collects football kits mainly from the top teams on the continent," she said. "I have to admit to forcing a Spurs kit on him, which he accepted grudgingly!"

Ravinder is a keen tennis player and plays for her local leisure centre ladies team two or three times a week. "I enjoy playing and it keeps you active and there's a good social side. It's an all year round game these days with access to indoor courts."

She also volunteers at her local Sikh Temple in Warrington and teaches the Punjabi language. "Those teaching skills are still being put to good use," she said.

### Women in Nuclear

The formation of a UK Chapter of the Women in Nuclear (WiN) organisation this year has increased the focus on women working in the industry. Ravinder feels the nuclear sector is improving and has not encountered any problems in her career so far.

"NNL has had a flexible approach to work wherever possible," she said. "I've earned promotion while working part-time. I think as long as you're committed to the job and willing to be flexible then you will be given the opportunity to do well irrespective of gender."

"NNL and the wider industry are working hard to attract more women and from my experience they will receive encouragement and support through their career. There are more women in leadership roles than ever before although that can always get better, which I'm sure it will as more women are attracted into nuclear."

### High Expectations

Looking ahead, Ravinder will be working hard to increase the positive impact of the Procurement team on NNL. "We have high expectations of ourselves," she said. "We're here to serve and support the business in the best way we can while at the same time making sure the business complies with best practice."



# NNL Prominent at NDA Event

Bigger than ever, the Nuclear Decommissioning Authority (NDA) Supply Chain Event 2014 took place in Manchester during November.

NNL participated fully by sending a strong team of delegates and maintained a high profile presence in the accompanying exhibition. In its fourth year, the event has become a firm fixture in the calendar for suppliers interested in getting involved in supporting the NDA and other organisations involved in the industry.

Keynote speakers included NDA Chief Executive John Clarke, Baroness Verma, Minister of State at the Department of Energy and Climate Change (DECC) and Rear Admiral Mike Wareham, Director of Submarines at the Ministry of Defence.

NNL's exhibition was positioned in the exclusive 'Innovation Zone' and featured among a group of leading edge nuclear technology providers, clients and suppliers. In addition to the Innovation Zone, the event included well over 200 other exhibition stands. Delegate attendance has grown impressively year on year.

NNL also participated in a 'Women in Nuclear' (WiN) speed mentoring session that was supported and addressed by Baroness Verma. The Baroness was very complimentary about NNL's role and contribution at the event.



# Paul's the Fellow

NNL MD Paul Howarth has been elected a Fellow of the Royal Academy of Engineering (FREng).

Paul, along with a number of other newly elected Fellows, joins the Fellowship in recognition of his outstanding and continuing contributions to engineering.

Professor Dame Ann Dowling, President of the Royal Academy of Engineering, said: "Our newly elected Fellows bring an enormous breadth of expertise to the Academy, widening our collective scope and knowledge.

"I know that they will all make significant contributions to the

Academy's activities in their time as Fellows and we look forward to working with them to create benefit for society through engineering."

Paul commented: "I'm delighted and honoured to receive this Fellowship from such a highly esteemed organisation. I very much take it as not only recognition of my own contribution to engineering but also that of NNL's ongoing work in supporting the UK's nuclear industry in a range of areas, including engineering."



L-R: Marianne Broadgate, AcQuire Technology Solutions, Alex Hulme, Westinghouse UK, Kat Lennox, NNL



# NNL's WiNning

**In the past, the nuclear industry has had a reputation for being too male focused. Historically, it's a fact that fewer females have been employed in nuclear than in other technical fields. Things are beginning to change and the contribution of women working in the nuclear industry has started to grow. But is progress quick enough?**

The statistics indicate that there's still some way to go. It's estimated that around 18% of the nuclear workforce is female compared to 26% in other energy sectors and utilities. And within the 18% employed in nuclear there is a greater concentration in lower graded jobs. Women currently make up around 46% of the UK workforce.

Helping to improve the situation, Women in Nuclear (WiN) is a global, non-profit making association of women working professionally in various fields of the nuclear sector. It currently has around 25,000 members including national chapters, members and individuals from 102 countries.

WiN has over 30 national, regional and international chapters throughout the world and is still growing. It's an inclusive organisation and is open to anyone - male or female. The overall aims of WiN are to strengthen the contribution of women in the industry, achieve a better gender balance and engage with women as part of the wider public.

A UK Chapter of WiN has been set up. Created at the beginning of 2014, WiN UK is working towards formal constitution and a full launch in January 2015. It's run by volunteers with policy and direction set by an Executive Board. The Board is made

up of a wide range of representatives from the industry and academia. WiN UK is supported by both the Nuclear Industry Association (NIA) and the Nuclear Institute (NI).

While still becoming established, UK WiN is already promoting the nuclear industry, implementing its own role and taking decisions on the activities which it will support. NNL is playing a pivotal role in UK WiN and has already launched its own Women's Network.

In parallel with the national organisation, the NNL Women's Network is collating ideas and thoughts and will decide the best means for the local network to support the national programme. It will also identify and discuss ideas or issues that NNL based members are facing.

The NNL Women's Network and input into UK WiN is being co-ordinated by Business Manager Olivia Thompson. She said: "The UK WiN team is made up of high-performing women from across the nuclear industry all volunteering their time to improve the image of the nuclear industry. The aim is to help attract more females to consider the nuclear industry and support them throughout their career.

"We're also keen to build the presence of women in senior and leadership positions. It's important that we develop a forum that's respected and helps us engage both inside and outside of the industry."

Olivia has been active in making early progress with the NNL Women's Chapter. Career profiles have been prepared on women working in NNL. This is part of a wider promotion of women working in all aspects of the nuclear industry. The profiles are being used to promote careers both locally in NNL and also the wider industry. A database is also being created of women prepared to go into schools or colleges to present nuclear based career talks to students.

NNL also recently hosted a visit to the Springfields site for aspiring chemistry and physics students local to the Preston area. The visit show-cased the breadth of careers that the nuclear industry supports and gave the students an opportunity to speak with scientists and engineers in advance of them deciding what subjects to choose at University. The visit was a huge success with lots positive feedback from the students, teachers and the NNL people involved.

NNL has also participated in a number of speed-mentoring sessions, the latest being at the Nuclear Decommissioning Authority (NDA) Supply Chain Event 2014 in Manchester. The sessions match mentees, both male and female, with high profile and senior mentors from across the nuclear sector. Each mentee has five minutes with each of the mentors to talk through a pre-prepared career or business question. It was fun and mainly aimed at people in the early stages of their career.



More information about the WiN organisation can be found on the global website or the UK website. There is also a LinkedIn page and you can follow on Twitter at [www.twitter.com/winuclear](http://www.twitter.com/winuclear).



@winuclear

# It's a Dream for Emma-Jo and Ben

Attracting young people into the industry and stimulating their interest is a major responsibility for everyone working in nuclear. The Dream Placement initiative presents an opportunity for West Cumbrian students to spend a week shadowing the Managing Directors of major businesses located in the region.

Emma-Jo Suitor, then a student at Workington Sixth Form Centre, and Ben McCullough from Lakes College successfully applied to the 2014 Dream Placement competition. Their reward was a chance to spend time with MD Paul Howarth and others at NNL to help them understand the business and how it operates.

This must have created quite an impression with both as they've since decided to take up apprenticeships with NNL. The Dream Placement competition is organised by Cumbria's Centre for Leadership Performance and placements are offered to join some of the area's most prominent companies including NNL, Sellafield Limited and BAE Systems.

Based at Energus in Workington, the Centre for Leadership Performance develops leadership capability across the private, public and civic sectors in Cumbria. NNL took part in the judging process that saw Emma-Jo and Ben win their prize. They were looked after during their week with NNL by Eileen Turner from External Relations and former Director Huw Morgan. There was also the opportunity to meet up with other Directors and leaders as well as spending time with a wide range of NNL people. These included apprentices and graduates and also people with vast experience of nuclear research.



Above: Ben and Emma-Jo with Kevin Warren of Dalton Cumbrian Facility.  
Below: With Paul Howarth and Eileen Turner of NNL

They visited the facilities at the NNL Central and Windscale Laboratories and also the Vitrification Test Rig (VTR) before they took in a full tour of the Sellafield site. This enabled them to gain an appreciation of site history, current challenges and NNL's role in supporting activities. Following on, they had the opportunity to gain a first-hand appreciation of the non-radioactive research being undertaken at NNL Workington.

Outside of NNL, Emma-Jo and Ben visited the new Dalton Cumbrian Facility and examined particle accelerator equipment to gain an understanding of the fundamental theory behind it. They gained an appreciation of the Innovus programme in Cumbria and how NNL and other contributors are supporting business development in the local community.

Clearly, their visit to NNL has been a positive influence on their career choices.

Ben is spending his first 12 months training as an Engineering Apprentice at local provider Gen 2 while Emma-Jo is working in the Central Laboratory as part of her Scientific Apprenticeship.

NNL will again take part in the Dream Placement programme in 2015.



## Adrian Goes Back to School

It was “back to school” for NNL’s External Relations Director Adrian Bull earlier this year.

Adrian returned to his former school, Manchester Grammar, to undertake some mentoring with a group of pupils. After a number of lunchtime visits from Adrian to guide them on their project – to make a business case for investing in a new nuclear plant ahead of other alternatives – the team visited NNL’s Warrington offices to make their pitch to Adrian and some NNL colleagues.

The team was slightly flustered to learn that one of their assessors had literally written the book on this subject – NNL Business Development Manager Ian Jackson is the author of a well-respected book entitled “Nukenomics”!

However, they put aside their nerves and gave a polished performance which culminated in a challenging questions and answers session. Afterwards, the feedback was that they had found the project interesting and useful.

The School’s Development Director Simon Jones commented: “I thought the visit to NNL was a fantastic experience for the boys – and I enjoyed it too!”

## Top Mark for NNL in IMechE Visit

**We were pleased to spend time with Group Captain Mark Hunt recently. Mark is President of the Institution of Mechanical Engineers (IMechE).**

When elected, Mark became the youngest Fellow of both the Chartered Management Institute and the IMechE with whom he has Board-level experience as Deputy President, a Member of Council and a Trustee on the Trustee Board.

In addition to his work with IMechE, Mark is also the Type Airworthiness Authority for the RAF’s intelligence gathering, surveillance, target acquisition and reconnaissance fleets of Sentinel and Sentry aircraft.

NNL MD Paul Howarth and Chief Engineer Richard Taylor hosted Mark’s visit, which included the opportunity to visit the Central Laboratory. He was especially interested in the work underway on the Alpha Laboratories (Phase 2) and High Active Cells (Phase 3) currently undergoing commissioning and the wider role of NNL.

A very good relationship has been established by NNL with IMechE and the other leading professional institutions. NNL people are encouraged to become chartered with these institutions and are very committed to ongoing professional development. The role and influence that IMechE and the other professional institutions have in attracting young people into the industry is extremely important.



Group Captain Mark Hunt (3rd from left) with Paul Howarth and the NNL team

## Fiona Runs into Lord Coe

A strong NNL turnout and a speech from Fuel Cycle Solutions Director Fiona Rayment were key NNL features at the latest Sellafield Environment, Health, Safety, Security and Quality Excellence Day.

During her talk, Fiona highlighted the importance of Environment, Health, Safety, Security and Quality best practice in NNL. She referenced welcome recognition for NNL from the Royal Society for the Prevention of Accidents (ROSPA). Winning the Research and Development Sector

Award for Occupational Health and Safety in 2014 is the eighth time in the past eleven years that NNL has won the top award.

Fiona met up with keynote speaker at the event Lord Sebastian Coe, one of Britain’s greatest ever athletes and host of the London Olympics in 2012. During his presentation, Lord Coe shared stories about the lessons he learned while overseeing the London Olympic and Paralympic Games. In many ways the enormous infrastructure and



logistical challenges of staging these events are similar to those faced by the modern nuclear industry.

# Wrestling with Mud for a Great Cause

Taking on a physically demanding muddy course featuring a series of challenging obstacles over almost ten miles in the cold, wet and murkiness of October... EASY!!

Perhaps not that easy but the No Ego 'Mud' Challenge proved to be all in a Saturday's work for the ladies from NNL People Services. Team Fitness Fusion was Anna Duckworth, Natalie White, Rebecca Wilson and Alison Richardson.

They took on the formidable 'Tunnel of Mud', 'The Mangle', 'Scafell Pike' and 'Getting Tyred' among the scary

25+ obstacles on the circuit just north of Greystoke Castle, Penrith. Although publicity stated it to be around 10K, the course was actually nearer to ten miles!

But, undaunted, the team stuck together and encouraged each other despite Rebecca suffering an early ankle injury and Natalie having a devastating fear of mud (except as part of an expensive spa treatment).

The fantastic four were elated to battle through as a team and successfully completed the course in under four hours - very impressive. As a team they wanted to challenge each other both mentally and physically while

raising money for a great cause, the Alzheimer's Society. Anna's grandad suffers from the disease and having witnessed the devastating effect it can have, she wanted to raise some much needed cash. Team Fitness Fusion has raised over £800 against the original target of £400.

We'll have to wait and see if they sign up for a repeat next year and maybe another personal best?



## Robert's a Winner - Again!

Winning awards is becoming a habit for NNL Graduate Chemist Robert Alford. Workington Laboratory based Robert has triumphed in the Nuclear Institute (NI) Young Generation Network (YGN) Excellence Prize for Newcomers to the Nuclear Industry.

YGN is the group created by the NI to offer younger members the opportunity to further their knowledge and encourage networking between the generations.

The Excellence Prize is specifically designed to recognise new people arriving in the industry (within the last five years) that have gone above and beyond the roles required of them.

There's an emphasis on the promotion of the nuclear industry and fulfilment of YGN objectives. The award recognises younger people and their accomplishments during their brief time in the nuclear industry.

Robert was also the recipient of the NNL Corporate Responsibility (CR) IMPACT Award very early in his career in 2013. He has represented NNL in CR related events and challenges and still maintains a strong interest in encouraging young people to participate in science and engineering.

Earlier this year, he was also nominated by NNL for the National Skills Academy Nuclear Graduate of the Year Award and made the final short-list. He eventually lost out but has now received deserved recognition from the YGN.

Congratulations to Robert on his latest well deserved award.

# STOP PRESS: NNL Triumphs at IChemE Awards

Celebrating excellence, innovation and achievement in the chemical and process industries, the Institution of Chemical Engineers (IChemE) annual Global Awards are very popular and much coveted. The awards are internationally regarded as a benchmark of achievement in chemical engineering innovation and excellence.

This makes NNL's triumph in the 2014 IChemE Global 'Nuclear Creativity Award' very special indeed. NNL have been named alongside consortium partners Sellafield Limited and De Dietrich Process Systems Limited for the 'Dust Scrubber Rebuild Safeguards Environmental Protection' project.

The Nuclear Creativity Award recognises innovation in the sector through the development or application of processes, products, techniques or technologies. It's open to applications that are relevant to any stage of the nuclear fuel cycle with an emphasis on safety, environmental and commercial benefits and is also measured on overall impact on society.

Winners were announced in early November at the awards ceremony, hosted by newsreader and TV personality Kate Silverton,



Nick Gribble (4th from left) and the NNL team receive their award

at Cheltenham Racecourse in Gloucestershire. The awards attract interest from all over the world and this year's shortlists included entries from China, Malaysia, India, Italy, Egypt, Australia, Belgium, Germany, Ireland, Nigeria, New Zealand, Singapore, The Netherlands, the UK and the USA.

NNL was represented at the ceremony by Technical Manager Nick Gribble who works on the Vitrification Test Rig (VTR) team (see page 09).

The VTR team provides close support to the Waste Vitrification Plant (WVP) at Sellafield.

Commenting on the award, NNL Vitrification Business Manager Julian Roe said: "I'm extremely proud that the joint team have won this award. For NNL, working in collaboration with Sellafield Limited and De Dietrich Process Systems it's an honour to have our project recognised."

In addition to the winners, NNL and Sellafield Limited were jointly 'Highly Commended' in the Nuclear Creativity sector for 'Thermal Imaging for Radioactive Material Characterisation'.

Many congratulations to our winners.

## #NNLinCumbria

Earlier this year, NNL ran a successful twitter campaign using the hashtag #NNLinCumbria. We took the opportunity to publicise some of the work we do in the county where our flagship Central Laboratory and over 600 of our employees are based. That's around 60% of our total workforce.

The campaign was a great success, as evidenced by the number of retweets and additional followers we gained.

External Relations Director Adrian Bull commented: "It was great that we were able to use social media to let people know about the importance of Cumbria in NNL's business and operations. And I was especially pleased that this was

recognised by both local and national stakeholders."

Key information tweeted during the campaign included:

"@uknnl is the 2nd largest industrial employer in West Cumbria - after @SellafieldLtd #NNLinCumbria"

"@uknnl has recruited 55 people in Cumbria in the last 2 years. That's over half our entire recruitment during the same period. #NNLinCumbria"

Follow us for more information.



@uknnl

# innovate

## NATIONAL NUCLEAR LABORATORY



NNL is proud to be a member or partner in the following organisations:



NNL operates at six locations in the UK:

Sellafield, Cumbria • Workington, Cumbria • Preston, Lancashire • Warrington, Cheshire • Harwell, Oxfordshire • Stonehouse, Gloucestershire