



NUCLEAR AMRC

NUCLEAR AMRC NEWS

THE NEWSLETTER OF THE NUCLEAR ADVANCED MANUFACTURING RESEARCH CENTRE

ISSUE 5 – Q4 2011

Apprentices at the cutting edge



New faces: Rolls-Royce apprentices at the Nuclear AMRC interim workshop.

Four Rolls-Royce apprentices are learning at the cutting edge of the nuclear manufacturing industry with a placement at the Nuclear AMRC.

Ben Hudson, 18, Conor Radford, 20, James Smith, 18, and Ben Sowerby, 25, (above, L-R) are in the third year of their apprenticeships. As part of Rolls-Royce's partnership with the Nuclear AMRC, they are spending 18 months working on new welding technologies in the centre's workshop.

"What we're doing is out of the norm for Rolls-Royce apprentices," says Sowerby. **"We're privileged to be doing what we're doing, because when we come out we'll have a much wider skills set than a normal apprentice."**

The apprentices spend four days a week on practical training, and one day on theory, working closely with Dr Steve Jones, company engineering specialist for fusion welding with Rolls-Royce Civil Nuclear.

"Not a lot of apprentices get the

opportunity to work with someone that high up," says Radford. **"Civil nuclear is a new business for Rolls-Royce, so it's exciting to be at the forefront of what's going on. It's nice to be part of the first wave."**

Following their placement, the four are likely to join the lead batch of part makers at Rolls-Royce's new civil nuclear facility, *Project PoWeR*, planned for a site close to the Nuclear AMRC on the Advanced Manufacturing Park in South Yorkshire.

"It's an exciting time for apprentices, with innovation and advanced technology making their training more challenging and yet more attractive," says Annette Valentine, training and skills manager for the Nuclear AMRC. **"Apprenticeships offer the opportunity to start building a career, and continue through to higher degrees and professional learning."**

Details of the Nuclear AMRC's own apprenticeship programme will be announced shortly.

TIC opens for business

The new Technology & Innovation Centre (TIC) for High Value Manufacturing has officially opened for business.

The TIC is a consortium of seven established manufacturing research centres, including the Nuclear AMRC, with the mission of stimulating UK manufacturing and reducing the risk of innovation for new and established businesses.

The *Technology Strategy Board* (TSB) is investing £140 million over six years in the High Value Manufacturing TIC. The funding will allow the individual centres to expand their own facilities and resources, and create a national network capable of addressing issues in high-value sectors from pharmaceuticals to power generation.

Business secretary Vince Cable MP declared the TIC open at the TSB's *Innovate '11* conference in London in October.

The other centres in the TIC are:

- AMRC with Boeing, University of Sheffield.
- Advanced Manufacturing Forming Centre, University of Strathclyde.
- Centre for Process Innovation, Teesside.
- Manufacturing Technology Centre, Coventry.
- National Composites Centre, University of Bristol.
- Warwick Manufacturing Group.

Technology and
innovation centre

High Value
Manufacturing

In this issue: Laboratory opens, ASK Nuclear, companies get Fit For Nuclear, membership news

Koso Kent Introl acts to become *Fit For Nuclear*



Specialist valve manufacturer Koso Kent Introl Limited is taking new strategic action after completing the Nuclear AMRC's *Fit For Nuclear* assessment.

Based in Brighouse, West Yorkshire, Koso Kent Introl (KKI) is a leading supplier of high-quality valves for demanding applications, primarily offshore oil and gas. Three years ago, the company started looking at opportunities in the nuclear industry as a way to diversify its customer base.

"We have a history of supplying sub-sea valves, and there's a lot of similarities between sub-sea and nuclear in terms of quality requirements," says Denis Westcott, KKI managing director.

But with no previous experience of nuclear, the company assumed it would need ASME 'N-Stamp' accreditation and was deterred from going any further.

Earlier this year, KKI was invited to take the *Fit For Nuclear* (F4N) assessment by lead assessor Dave Roberts. After KKI's managers completed the online questionnaire and received initial feedback, Roberts visited the company to take a more detailed assessment and advise the company on the way forward.

Roberts says: ***"Koso Kent Introl is exactly the kind of company we want to engage through *Fit For Nuclear* – an established supplier of high-quality products with the***

ambition to tackle new markets."

One of Roberts' key messages was that companies at Kent Introl's position on the supply chain didn't actually need ASME accreditation. ***"Nuclear quality is a confusing area even for established manufacturers, and demystifying the requirements is a significant part of our work,"*** says Roberts.

"Fit For Nuclear has been a very good guide in," says Westcott. ***"Even though we had a limited amount of experience in nuclear, it was a very useful programme to talk to someone about what we need to do. If we'd carried on as we were, we would have gone after N-Stamp which would have been unnecessary."***

The F4N assessment also highlighted areas where KKI could improve its performance and operations to better meet the strict demands of the nuclear industry. ***"There were some areas which we were already aware of, but it put the emphasis on the need to get on with it quicker,"*** Westcott says.

KKI has now employed a consultant to help it prepare for the nuclear supply chain, and is rewriting its strategic plan to include the lessons of F4N.

"The key thing for people who have never been involved with nuclear is to not under-estimate the requirements of the industry," Westcott says.

Manufacturing companies can take the *Fit For Nuclear* assessment for free at <http://namrc.co.uk/work-with-us/f4n/>

"The assessment is providing a good test of a company's capability," says Roberts. ***"All the companies assessed so far have responded well and are making strides to improve their capabilities."***

Quality insight at new workshops

The Nuclear AMRC's series of quality workshops continues in December, with the aim to help engineering manufacturers understand the quality requirements of the nuclear industry.

Developed in association with the *Manufacturing Advisory Service*, the workshops are designed for companies which are interested in entering the supply chain for nuclear new-build, but which have limited experience in the sector.

The half-day sessions, delivered by *Parsons Brinckerhoff*, introduce the quality demands of nuclear manufacturing, and describe the roles and responsibilities of manufacturers.

The first workshop will be held at the *Cambridge Technology Centre*, Hertfordshire, on *Tuesday 6 December*, and will focus on what Inspection Agencies look for when assessing a nuclear manufacturer.

Attendance is free to representatives of interested UK manufacturing companies, but places are limited. Locations and subjects of further workshops will be determined by demand.

For more information, contact Nuclear AMRC quality manager Paul Bunting: p.bunting@namrc.co.uk

Targeted help for Yorkshire SMEs

A new programme aims to help manufacturing SMEs in the Yorkshire & Humber region access the opportunities of the nuclear industry.

The *Nuclear Supply Opportunities for Yorkshire* programme is based around a one-day workshop, with new events held monthly. Participating companies can assess their current operations, and arrange a full review from one of our manufacturing experts.

Nuclear Supply Opportunities for Yorkshire is a regional initiative from the *Nuclear AMRC*, delivered by *Director Resource* and *Brook Corporate Developments*. For more information, contact Dave Roberts: dave.roberts@namrc.co.uk

For nuclear knowledge, just ASK

The Nuclear AMRC has launched a new tool to help manufacturing companies access the specialist knowledge of its team and partners.

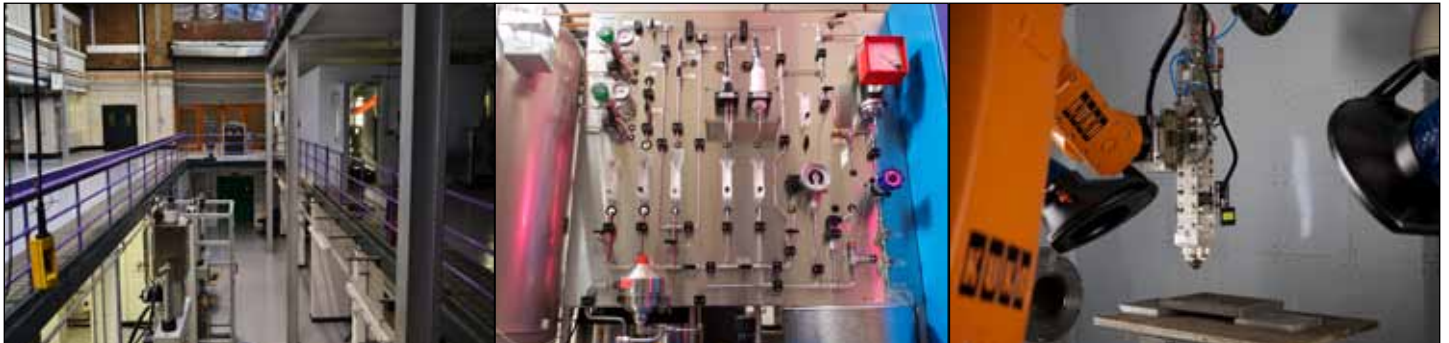
ASK Nuclear allows companies to submit their questions about nuclear manufacturing online, and obtain reliable answers on topics such as manufacturing technology, quality, training and industry information.

The service is free for UK companies.

<http://namrc.co.uk/work-with-us/ask/>



Material benefits from new Laboratory



Nuclear AMRC Laboratory: state-of-the-art facilities to reduce risk for manufacturers, including specialised autoclaves (centre) and laser welding equipment (right).

The new Nuclear AMRC Laboratory has officially opened, hosting an array of state-of-the-art equipment for manufacturing and materials research.

Managed by *The University of Manchester's Dalton Nuclear Institute*, the Laboratory will work closely with the Nuclear AMRC's research factory in South Yorkshire. By focusing on materials research and analysis, the Manchester team will ensure that components produced by new manufacturing techniques and technologies meet the high standards demanded by the nuclear industry.

“Components for nuclear power plants need to perform for 60 years or more in an extremely demanding environment. Changes in manufacturing process can substantially change the performance of the materials used, so that their ability to withstand irradiation, corrosion and thermal effects can be impaired,” says Professor Mike Burke, Nuclear AMRC research director.

“It is vital that the products of new manufacturing technologies are rigorously tested before being introduced into commercial production. The Nuclear AMRC Laboratory gives manufacturers the capability to fully understand the benefits, and to resolve the risks, of new manufacturing processes.”

The Manchester team will collaborate on developing and proving advanced welding technologies. Welding is an essential part of fabrication and assembly for nuclear systems, but the welding process can also have serious effects on long-term material performance.

The welding and cladding resources at the Nuclear AMRC Laboratory feature some of the most advanced equipment found at any

UK university.

Key facilities include an industrial-scale submerged arc welding and cladding system, a narrow gap gas-tungsten welding system, and automated high-power laser welding equipment which can be combined with other kit to provide new modes of fabrication.

Research is underpinned by detailed analytical characterisation, thermo-mechanical testing, and stability assessment, to make sure that new processes are appropriate for the production of nuclear components.

The Laboratory includes dedicated corrosion and mechanical testing equipment to rapidly assess the properties and performance of processed materials. The Laboratory boasts a suite of seven autoclaves to analyse corrosion and

cracking behaviour under intense temperatures and pressures, and two high-speed testing machines to assess mechanical performance.

The Nuclear AMRC Laboratory is based in the former Royce Laboratory, part of a previously abandoned Grade II listed building in The University of Manchester's north campus. The facility has undergone an £8 million expansion and refurbishment, backed by the *Department for Business, Innovation and Skills* and the *Northwest Development Agency*.

Nuclear AMRC members can also draw on the wider resources of the Dalton Nuclear Institute, including the *Dalton Cumbrian Facility* for assessing radiation effects on materials, and the *Henry Moseley X-Ray Imaging Facility* for 3D material characterisation.



The first major pieces of manufacturing equipment have been installed at the Nuclear AMRC's new facility on the Advanced Manufacturing Park, South Yorkshire.

Initial equipment includes a *Mori Seiki NT6600* mill-turn centre, which will be used to investigate novel techniques for producing ultra-slender reactor parts, and the innovative robot machining cell (above) developed in partnership with *Nikon Metrology*.

The 8,000m² research factory was handed over to the Nuclear AMRC team in early October. An official opening will be held in the new year.



NES signs up in latest membership round

Industry specialist **Nuclear Engineering Services (NES)** is one of four new companies to sign up as a full member of the Nuclear AMRC.

Wolverhampton-based NES provides design, manufacture, test, commissioning, installation and training services for the nuclear decommissioning, defence and new build markets. NES joins the Nuclear AMRC as a Tier One member.

Anthony Cundall, head of nuclear new build for NES, said he was thrilled to join the centre.

"The experience and resources

developed by NES from more than 60 years in the nuclear industry, allied with the latest expertise in manufacturing and research techniques from the Nuclear AMRC, will undoubtedly assist the UK supply chain to be more competitive," Cundall said.

Quality specialist *Lloyds Register* has also joined the Nuclear AMRC as a Tier Two member. Lloyds Register has over 50 years experience of providing independent assurance and verification services to the UK nuclear industry.

Other new Tier Two members provide

further specialist capabilities to the Nuclear AMRC's manufacturing and machining research programmes.

TBT Tiefbohrtechnik is a world-leading provider of deep-hole drilling machines, tools and services.

Sheffield-based *Technicut* produces specialist rotary cutting tools for high-speed and high-performance machining. Technicut worked extensively with the AMRC with *Boeing* to develop its award-winning MegaFlute milling technology and is now working to optimise Megaflute for nuclear manufacturing applications.



NUCLEAR AMRC
ADVANCED MANUFACTURING RESEARCH CENTRE

About the Nuclear AMRC

The Nuclear Advanced Manufacturing Research Centre is a collaborative initiative led by The University of Sheffield, The University of Manchester, and a consortium of industrial partners.

The Nuclear AMRC aims to be the focal point for the civil nuclear manufacturing industry in the UK. It works with members to develop new manufacturing technologies to meet the needs of the new generation of nuclear power stations, to help companies join the nuclear supply chain, and to provide support in skills and quality. For more information call 0114 222 9900 or visit <http://namrc.co.uk>

Nuclear AMRC, Brunel Way, Advanced Manufacturing Park, Rotherham S60 5WG



SUPPORTED BY:



MEMBERS:

