



NUCLEAR AMRC

NUCLEAR AMRC NEWS

THE NEWSLETTER OF THE NUCLEAR ADVANCED MANUFACTURING RESEARCH CENTRE

ISSUE 1 – SEPTEMBER 2010



HOW THE NUCLEAR AMRC BUILDING WILL LOOK

The shape of things to come

Building work has begun on the Nuclear AMRC's new core facility. The 8000 sq m building on the Advanced Manufacturing Park (AMP), South Yorkshire, is designed to act as the focal point for the civil nuclear manufacturing industry in the UK.

The Nuclear AMRC building will sit alongside the established University of Sheffield AMRC with Boeing, a global centre of excellence for the aerospace industry. The nuclear centre will be almost twice the size of the current AMRC Factory of the Future building.

The core of the Nuclear centre will be 5200 sq m of workshop space. Over half of this will be a flexible, open-plan shop floor. The rest will be dedicated to research areas including machining, robotics and assembly; welding, firing and heat treatment; cladding technology; and non-destructive evaluation.

Workshop equipment will include large mill turn and machining centres, customised to the requirements of the nuclear supply chain; submerged arc welding facilities; and a range of robots and manipulators.

The centre will also feature accommodation over three storeys at the front of the building. Facilities will include laboratory and technical support space, a VR cave for

virtual assembly research and training, plus office space and secure meeting rooms.

To preserve commercial confidentiality for members, security will be tightly controlled throughout the building. A public exhibition space near the entrance will host a 'Nuclear in the Community' exhibition to promote the industry and employment opportunities.

Like the *Factory of the Future*, the Nuclear AMRC building has been designed by Bond Bryan Architects to high environmental quality standards, including significant renewable energy generation. Planning permission has been secured for a 850kW capacity wind turbine.

Construction is scheduled to complete in late 2011. The Nuclear AMRC is meanwhile operating from interim premises on AMP, giving it the facilities to develop operations and begin collaborative R&D.

The 300 sq m office suite in the AMP Technology Centre is fully open for business, offering meeting and exhibition space. The centre is also developing a 1350 sq m workshop unit on the same site, with initial facilities to include mill turn and 5-axis machining centres, welding stations, and a virtual reality room.

Welcome to the first quarterly newsletter from the Nuclear AMRC

Nuclear AMRC News is aimed at current and potential members, companies which are already active or seriously interested in the UK nuclear manufacturing supply chain, and other interested parties. The newsletter will keep you updated on the latest developments at the centre, and key news from our partners.

Also keep an eye on our website – www.namrc.co.uk – which is due to relaunch in September. We've been working hard to develop the website as a key resource for the UK civil nuclear supply chain. As well as detailing who we are and what we do, the expanded site also offers a wealth of market research and business information to help you make the most of the opportunities. Let me know what you think.

You can register on the website to make sure you keep in touch with the latest information, including these quarterly newsletters and exclusive e-bulletins. You can also follow us on **Twitter** – @NuclearAMRC.

And, if your company has news of interest to the Nuclear AMRC community, please do get in touch.

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- Supply chain opportunities for SMEs

The Nuclear AMRC is launching a series of **Quality workshops** in association with Parsons Brinkerhoff. Full details will be announced on our website.

Nuclear suppliers decide priorities

A cross-section of suppliers to the nuclear industry have identified key issues for the Nuclear AMRC to tackle.

Managers from around 20 companies were invited to intensive workshop sessions at the AMRC Factory of the Future in May and July. Participating companies included major industry suppliers *Rolls-Royce*, *Corus* and *Sheffield Forgemasters*, plus a selection of specialist manufacturers and metalworking businesses.

Participants split into small working groups to discuss issues in the three core areas for the Nuclear AMRC – manufacturing research, accreditation, and skills – before regrouping to compare notes. Their key messages are as below.

Research: The key to nuclear manufacturing is understanding the requirements of the end user, including material specifications and interpretation of industry standards. A very useful tool would be a virtual model of a complete reactor system to help suppliers understand how the system fits together.

Virtual simulation may also be useful for the testing and inspection of finished components.

Testing is a major challenge for components such as valves, as there are very few testing facilities available.

Materials performance was identified as a key area. More work is needed on the processing of new materials. For existing materials, several participants felt they lacked in-house metallurgical skills.

Welding was highlighted as a very significant area for engineering research, including the use of electron beam welding as an alternative to forging.

Opportunities for suppliers to the nuclear industry will be relatively limited, participants noted. **“When you have the opportunity, you have to make sure you can supply the right components at the right quality at the right time,”** said one.

Accreditation: Suppliers need more guidance on the interpretation of standards, including a better understanding of exactly who does and doesn't need nuclear accreditation, and which code – ASME or RCCM – will be required by reactor providers.

The Nuclear AMRC should help members

understand the requirements and how to satisfy them, managers said. One suggestion was for the centre to establish a council of top-tier members who could interact with the standards boards.

“What we need is a roadmap for each code so there's a consistent approach – it's variance that costs time and money,” said one manager.

Skills: The initial challenge is to understand skills requirements across the supply chain, and then to address gaps. The Nuclear AMRC could lead an industry-wide study, participants suggested.

The second major challenge is acquiring and retaining capabilities at all levels. Again, the Nuclear AMRC can play a key role in a national knowledge centre, with an emphasis on supporting SMEs.

Apprenticeships were also highlighted as a key requirement, with a drive to attract highly talented young people into technical apprenticeships.

Funding structures also need to be addressed to meet the requirements of current workers who need to upskill while working. One participant noted: **“There's plenty of funding available for full-time education, but little for part-time.”**



NUCLEAR THOUGHT LEADERS: MANAGERS MEET AT THE AMRC

Manchester conference kicks off SME workshops

Small and medium-sized manufacturing companies can gain invaluable insight into opportunities in the civil nuclear supply chain, through a new series of workshops from the Nuclear AMRC and the Manufacturing Advisory Service (MAS).

The events kick off with a free one-day conference, **Nuclear Supply Chain Opportunities for SMEs**, held in Manchester in September. The event is hosted by MAS in association with the Nuclear AMRC and other industry bodies.

As well as detailing the supply chain opportunities of nuclear new build, the day will also highlight opportunities in site maintenance and decommissioning. Speakers include senior managers from top tier manufacturers including *Areva*, *Laing O'Rourke* (part of *Westinghouse's* nuclear power delivery consortium) and *Doosan Babcock*.

Alan Cumming of *EDF Energy* will provide an exclusive presentation on nuclear new build from the customer's point of view, while John Griffin of *Jacobs Engineering* will give the inside view of supplier relationships from the Tier 2 perspective. Steve Court, operations director at the Nuclear AMRC, will introduce the centre's support and services for SMEs.

The event, at the **Manchester Conference Centre** on **Monday 27 September**, is free for SME manufacturers from across the UK. There is an entrance fee for large manufacturers and other businesses.

The conference will be followed by a series of focused in-depth workshops on market entry requirements and how to compete for contracts in the nuclear industry.

For full details of the Manchester event and online booking, go to: www.mas-nw.co.uk/events



Supply chain firms sign up

The first wave of suppliers to the nuclear industry have signed up as members of the Nuclear AMRC. Four companies have so far become Tier Two members, with more in negotiations.

Tier Two membership is designed for companies which supply to the nuclear industry majors, and which want to refine their services and put themselves at the heart of the supply chain. Membership gives access to the research facilities, support services, and networking and development opportunities of the Nuclear AMRC.

The first to sign up was heavy engineering group DavyMarkham. The Sheffield-based firm designs, manufactures and assembles large equipment for the power generation industries.

"This is a unique opportunity for all suppliers to the UK's new nuclear build program to align their business and operations to the high standards which are demanded by the industry," said Kevin Parkin, managing director at DavyMarkham.

Also from Sheffield, *Independent Forgings and Alloys Ltd* (IFA) has provided forged components for UK nuclear programmes since the 1950s. Martin Burnham, chairman and chief executive officer, said: **"Metals forming is at the heart of advanced manufacturing, and we see the production of quality-assured goods as the key to backing nuclear new-build. A lot of the metals used in a reactor are non-ferrous, and we have the most diverse integrated forging centre in Europe."**

Parsons Brinckerhoff, an international engineering consultancy with extensive experience in nuclear quality services, and *Maier Ltd*, a supplier of advanced



READY FOR NEW BUILD: KEITH RIDGWAY AND KEVIN PARKIN

alloys for high-performance applications, have also joined. The Nuclear AMRC has a target of around 30 Tier Two members.

Keith Ridgway, programme director at the Nuclear AMRC, welcomed the interest in the centre. **"UK-based firms need to understand the opportunities and requirements of supplying goods and services to the nuclear market, and we can help give them the support they need,"** he said.

UK can lead world in nuclear manufacturing, says Powell

UK manufacturers have a unique opportunity to put themselves at the forefront of the global nuclear industry, according to David Powell, head of customer relations for reactor provider Westinghouse UK.

Global nuclear capacity is expected to reach 1280GWe by 2050 from 372GWe today, Powell noted. **"The UK has the opportunity to really benefit from being at the start of this,"** he said. **"We want to find the best ways of working with the UK supply chain, which is already strongly engaged with meeting our global needs."**

Powell was speaking at the *Advanced Manufacturing Forum*, a regular industry-led event organised by the *University of Sheffield AMRC*. The May event, which focused on opportunities in the nuclear supply chain, was the largest AMF to date with over 120 attendees.

Westinghouse aims to have the first of its AP1000 reactors operational in the UK by 2020. **"We buy where we build, and will do the same in the UK,"** Powell said. **"By the fifth AP1000 unit, we expect that over 70 per cent of what we need will be coming from the UK."**

Westinghouse will support its supply chain by technology transfer and by strategic investment, as with its support for *Sheffield Forgemasters'* proposed investment in a 15,000-tonne forging press. **"At the moment, we rely on Japan Steel Works for large forgings,"** Powell noted. **"For a company like Westinghouse it's never good to depend on just one supplier."**

Westinghouse confirmed its ongoing support for *Forgemasters* following the withdrawal of Government loan support in June. *Forgemasters* has since



DAVID POWELL: WESTINGHOUSE WILL BUY WHERE IT BUILDS

suspended work on the project, but will review its options in the new year.

Graham Honeyman, chief executive of *Sheffield Forgemasters*, also spoke at the AMF to emphasise the opportunities of the nuclear new-build programme. **"This could resurrect manufacturing in the UK, more than anything else we're doing currently,"** he said.



Dalton Nuclear Institute expands facilities

Nuclear AMRC facilities in Manchester are receiving £8m investment to complement the capabilities at the Yorkshire centre. The Dalton Nuclear Institute is expanding its world-leading nuclear research laboratories to provide Nuclear AMRC members with a full range of manufacturing research support.

The expanded laboratories will focus on three key areas: new materials and processing, including cutting; welding & joining; and surface technology.

Research in each area will be underpinned by detailed analytical characterisation, thermo-mechanical testing in nuclear environments, and modelling and simulation, to make sure that all technologies are optimised and appropriate for the production of nuclear components.

The new facilities are backed by £8m grant

funding from the *Department for Business Innovation and Skills (BIS)* and the *Northwest Development Agency (NWD)*. The investment covers a range of state-of-the-art equipment including machining, cutting and welding centres; tensile testing machines and autoclaves; and electron and x-ray analytical facilities.

The capabilities of the expanded laboratories will be supported by the *Dalton Nuclear Institute's* other research initiatives, which are also the subject of significant investment.

In 2009, the *University of Manchester* secured NWD funding for the new *Centre for Nuclear Energy Technology (C-NET)*, a £16m initiative led by the *Dalton Nuclear Institute* to build on the University's existing expertise in reactor technology. C-NET will focus on areas such as materials

irradiation, structural mechanics and reactor physics.

The Institute is also working with the *Nuclear Decommissioning Authority* to establish the *Dalton Cumbrian Facility*, a £20m centre focusing on new capabilities in radiation sciences and decommissioning engineering.

The *Dalton Nuclear Institute* was founded in 2005 to provide the prime focus for The University of Manchester's capability across the full range of nuclear science and engineering. The Institute already enjoys strong links with key players in the nuclear new build programme. *EDF* is funding a new chair in modelling and simulation, while *Westinghouse* funds a research chair in nuclear fuel technology. And *Rolls-Royce* recently announced a new *Nuclear University Technology Centre* at Manchester.

Career opportunities

The *Nuclear AMRC* will be recruiting a variety of talented engineers, researchers and industry experts over the coming months. To find out about current vacancies in both South Yorkshire and Manchester, go to www.jobs.ac.uk and search for '**Nuclear AMRC**'.



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, help companies join the nuclear supply chain, and provide support in training and accreditation. For more information call **0114 222 9900** or visit www.namrc.co.uk
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