

## **UK Industry prepares for €5 Bn ITER project**

### **ITER event highlights opportunities for UK companies in big science projects**

UK industry signalled its commitment to the €5 Bn International Tokamak Experimental Reactor (ITER) fusion project when over 230 people from approximately 175 companies, UK Trade and Investment, trade associations and regional development agencies and devolved assemblies attended last week's 'ITER Business Opportunities for UK industry' event organised by UKAEA at its Culham site in Oxfordshire.

The 'ITER Business Opportunities for UK industry' event brought together many organisations including large civil and mechanical engineering companies as well as specialist SMEs to brief them on the status of fusion research and the significance of ITER in the development of an eventual commercially viable fusion reactor.

Professor Sir Chris Llewellyn-Smith, director of UKAEA Culham Division said "It is now widely recognised that no single energy source will meet all the earth's future energy needs. Fusion power has a role to play as part of a portfolio of energy sources. Although significant physics and engineering challenges lie ahead, there are no obvious barriers once fusion has passed the threshold of viability. ITER is a key stepping stone towards establishing fusion as a viable source of energy. UK companies with their skills, technology and most of all their enthusiasm have shown at this event that they are ready to play a role in building ITER".

### **ITER Engineering and Procurement**

Size matters in fusion research. Bill Spears, Head of Public Information for the ITER Project, gave companies an insight into the engineering challenges involved in constructing ITER. "Fusion is a global research project. The ITER partners represent over half the world's population. Our task is to bring together their expertise, including that gained on large prototype construction during the design phase, in the construction of the ITER device," commented Mr Spears.

In addition to the unprecedented size of the superconducting magnets and other structures, the ITER construction team is faced with successfully interfacing millions of parts often with complex interfaces, specifying materials capable of withstanding the extremely high heat fluxes generated during fusion and managing the relationship

with seven ITER partner procurement agencies for the EU, United States, China, Russia, South Korea, India and Japan. "We envisage a central ITER team in Cadarache with branch offices working closely with the partners' domestic agencies who will handle 90% of ITER procurements," Spears noted. The European agency will be in Barcelona.

While the central ITER team and partner procurement agencies are being formed, the European Fusion Development Agreement (EFDA) is preparing in Europe for procurement for ITER. Enrico Di Pietro, EFDA Close Support Unit Barcelona Co-ordinator, and Field Co-ordinator for ITER site preparation, outlined the ITER procurement system and programme.

Europe is providing 36% of the ITER construction including manufacturing and associated engineering with the first contracts expected to be placed in 2007. ITER procurement is broken down into work packages. The split of the work involved in each package has already been agreed with the ITER partners with the EU supplying some packages completely and having a share in others. In total the EU contribution to ITER is expected to be covered by about 220 contracts: 130 fabrication and 90 service contracts.

To assist EFDA, and eventually the ITER European Domestic Agency (name to be agreed), to identify European companies wishing to compete for contracts and / or undertake sub-contract work; an on-line database is being compiled. Enrico Di Pietro, encouraged companies to register on the database. It will be available to EFDA, the European Domestic Agency, Tier 1 companies looking for sub-contractors, and Tier 2 and Tier 3 companies looking for opportunities both as subcontractors and to group with companies who have won contracts. In addition, the database will eventually be used to inform companies of forthcoming contracts opportunities and details of contract awards.

Research into fusion systems will continue during ITER's construction. According to the UKAEA Culham Division Operations Director, Frank Briscoe, UKAEA is well placed to play a major role in diagnostics and heating systems research, which will lead on to procurement of those systems for ITER. "The LIDAR Thomson Scattering diagnostic and ion cyclotron and neutral beam heating systems are areas in which we intend to play a major role. Within the ITER procurement regime we will be

looking for UK companies to partner with us in building the systems for ITER,” he said.

### **ITER and beyond...**

UK Government believes that UK companies have much to offer large science projects like ITER. To this end Nathan Hill, Industry co-ordinator for the Particle Physics and Astronomy Research Council and the UK Technology Transfer Co-ordinator for CERN, ITER, also representing UK Trade & Investment (UKTI), introduced the new Research Facilities Special Interest Group (RFSIG). “We believe that companies need to view their involvement in large science projects as representing on-going business rather than a series of ad hoc projects. The Large Facilities Programme will pull together the procurement opportunities for a broad range of science projects including CERN, European Southern Observatory, Diamond and many others, with the aim of giving companies a steady flow of business opportunities,” explained Nathan Hill. Further details of RFSIG can be found at <http://www.qi3.co.uk/sktn/rfsig.asp>.

### **UK Companies Experiences of ITER**

Many UK companies have considerable experience of working on fusion projects. The ITER event heard from three companies working on ITER contracts placed by EFDA ahead of formation of the European Domestic Agency. AMEC-NNC, an engineering consultancy with many years experience of fusion is currently undertaking development and supply of plasma wall samples. Phoenix Inspection Systems, a SME company and specialist Non-Destructive Testing equipment maker, reported on the development of the NDT inspection system for the ITER vacuum vessel, its first main supplier contract where previously it has handled sub-contract projects.

Companies new to fusion research can also expect to win ITER projects as Jacobs Babtie, a subsidiary of Jacobs Engineering Group, reported. With no previous experience of fusion, Jacobs Babtie has been awarded a contract to provide civil and structural engineering and general plant design work for the ITER Cadarache site.

All the companies agreed that working in fusion is technically demanding and requires excellent project management skills. “We’d encourage any UK company

that's prepared to make the effort to understand the customer's requirements, meet the technical demands and enjoy the kudos that comes with working on this high profile project," said Karl Quirk, Managing Director, Phoenix Inspection Systems Ltd.

### **Getting UK industry involved**

Dan Mistry, UKAEA's Fusion and Industry Manager, welcomed the fact that so many companies chose to attend the ITER event. It demonstrates that UK industry is committed to applying their competencies to the construction of ITER. For some they are building on their experience of working on the Joint European Torus (JET) experiment here at Culham and at other European Fusion Labs. Others, such as Jacob Babbie, who are new to fusion, are able to transfer their expertise acquired in other markets to help build ITER.

"I believe there are many UK companies who have the necessary skills/expertise to help build ITER and I would strongly urge them to contact us and register their details on our web site, as well as on EFDA's industrial database for ITER; in this way they will be kept informed of ITER developments and contract opportunities," he said.

For further information on ITER and UK industry contact Dan Mistry on 01235 466607, e-mail [dan.mistry@ukaea.org.uk](mailto:dan.mistry@ukaea.org.uk) or visit [www.fusion.org.uk/industry](http://www.fusion.org.uk/industry), [www.iter.org](http://www.iter.org) and [www.efda.org](http://www.efda.org). Companies can register on the databases via these UK and EFDA websites.

## **BACKGROUND**

### **UK and Fusion research**

Fusion research in the UK is conducted by the UKAEA at the Culham Science Centre. The Centre is home to the UK's fusion programme most notably the MAST (Mega Amp Spherical Tokamak) experiment. It is also home to the world's largest fusion experiment the Joint European Torus (JET), operated under the European Fusion Development Agreement.

UK industry has already played a significant role in fusion research. It has supplied plant, equipment and technical expertise to the UK's fusion programme, JET and other European and international fusion projects.

For more information on UK Fusion research visit [www.fusion.org.uk](http://www.fusion.org.uk)

For more information on UKAEA Fusion and Industry visit:  
[www.fusion.org.uk/industry](http://www.fusion.org.uk/industry)

### **Fusion power**

Fusion is the process which powers the sun and the stars. When light atomic nuclei fuse together to form heavier ones, a large amount of energy is released. Fusion research is aimed at developing a prototype fusion power station that is safe and reliable, environmentally responsible, economically viable, with abundant and widespread fuel resources. In Europe, fusion research is organised in a coordinated research programme, which provides for an intensive use of all relevant R&D resources in pan-European collaborations on all the major research topics.

### **ITER**

ITER will be a major experimental facility to demonstrate the scientific and technical feasibility of fusion power. The construction costs of ITER are estimated at about 5 billion Euros over ten years, a large part of which will be awarded in the form of contracts to industrial companies and fusion research institutions. Another five billion Euros are foreseen for the twenty-year exploitation period. Europe will contribute 45% of the costs, while the other six parties to this joint international venture (Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA), will contribute the rest.

In June 2005, the partners decided unanimously to choose the European site at Cadarache, in the South of France, as the location for the construction of ITER. Europe's contribution to the ITER construction programme will be procured through the European Domestic Agency, which will be located in Barcelona.

For more information visit: [www.iter.org](http://www.iter.org) and [www.efda.org](http://www.efda.org)

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