

9 Industry

9.1 OVERVIEW

The role of CCFE's Fusion and Industry programme is expanding as it seeks to fulfil its two main tasks:

- To increase the number of UK companies bidding for fusion contracts, especially from the ITER programme;
- To identify and promote areas of technology transfer between fusion and industry.

With the growth of procurement activity both from (a) the European ITER Domestic Agency known as 'Fusion for Energy' (F4E) in Barcelona, and (b) the central ITER International Organisation (ITER IO) in Cadarache, France, the Fusion and Industry team is keen to ensure appropriate UK companies respond to ITER contracts.

The technology transfer activity continues to focus primarily on the Technical Support Package that provides assistance / support to suitably qualified start-up companies located in the Culham Innovation Centre through a combination of technical know-how and practical engineering.

9.2 LINKS TO GOVERNMENT

When possible the Fusion and Industry team continues to work in partnership with the UK Trade and Investment (UKTI) and other government agencies in raising awareness in UK companies of business opportunities in fusion research in general and ITER in particular, giving them timely information and alerting them to procurement processes and deadlines. With UKTI support, an event was held at CCFE reported in section 9.6.4.

9.2.1 VISIT OF THE SCIENCE MINISTER

In September 2010 David Willetts MP, Minister of State for Universities and Science, visited CCFE for a briefing on the status of UK and European fusion research, and to discuss the commercial opportunities open to British companies from ITER construction. He met senior representatives of four UK firms, of which three have already secured large contracts and the fourth is actively looking for opportunities. CCFE was able to inform the Minister that over 140M€ worth of work had already been secured by UK companies.

9 Industry



Figure 9.1: Steve Cowley, CCFE Director, explaining fusion to David Willetts MP.

9.2.2 CCFE AND UK TRADE & INVESTMENT

At the request of UK Trade & Investment, Fusion and Industry exhibited at ‘Technology World’ held in London in December 2010. One of the guests that visited the stand at this event was Mark Prisk MP, a Minister in the Department for Business, Innovation and Skills, who was given an overview on fusion and the success so far of UK companies gaining work from the ITER programme.



Figure 9.2: Mark Fisk MP (L) and Dan Mistry, CCFE's Fusion and Industry Manager, at Technology World.

9.3 PARTICIPATION OF UK COMPANIES IN FUSION AND ITER CONSTRUCTION

9.3.1 CONNECTION WITH APPROPRIATE UK COMPANIES

The Fusion and Industry team has continued its awareness programme by identifying appropriate UK companies and encouraging them to bid for work packages that are being launched by F4E and also by the ITER IO. Typical activities undertaken include:

- a) Alerting / informing companies on the industry database of opportunities, events, etc., through email ('E-News'), the 'E-Zine' *Fusion Business* and the dedicated Fusion & Industry website <http://www.fusion-industry.org.uk/>;
- b) Connection with suitable companies by working with government and other agencies (UK Trade & Investment, Regional Development Agencies, Devolved Agencies, Manufacturing Advisory Service and various Trade Associations) and by attendance at various workshops/seminars;
- c) Visits to and from many UK companies.

9.3.2 EUROPE'S INDUSTRY LIAISON OFFICERS (ILOs)

The European ILOs meet regularly with F4E to understand the forthcoming opportunities and to raise any concerns from their countries' companies. They are also in regular contact to try to help form pan-European consortia of companies. The UK's Industry Liaison Officer for fusion is Dan Mistry of CCFE.

Dan Mistry is also in regular contact with F4E's and ITER IO's engineers and procurement teams to understand the requirements for their work packages to help identification of suitable UK companies.

9.3.3 F4E'S AND ITER IO'S FORWARD WORK PLANS

F4E continues to release regular updates on forthcoming Calls for Tender. This advanced notification along with identification of key skills / expertise has enabled us to identify and prepare companies to respond in a more proactive way. F4E also have a 'portal' for industry at: <https://industryportal.f4e.europa.eu/default.aspx>.

F4E has also held specific 'Information Meetings' relating to Buildings, Power Supplies, the Neutral Beam Test Facility, etc., to disseminate technical and commercial information and also encourage companies to form consortia, especially as some packages will require a wide range of skills and expertise which are unlikely to be found in one single company.

ITER IO also provides information on its forthcoming Calls. Again the Fusion and Industry team, alongside with the other ILOs, is working very closely to ensure European industry plays a key role in the construction of ITER.

Our role at CCFE is to advertise these opportunities and events to UK companies and use our fusion expertise to brief them as appropriate.

9.4 UK COMPANIES WINNING KEY FUSION CONTRACTS

A number of UK companies have won contracts for JET and ITER including those featured below. CCFE has been instrumental in introducing several of these companies to fusion. Further examples may be found in *Fusion Business* <http://www.fusion-industry.org.uk/newsletter.asp>.

MAST, the UK fusion machine will, over the next 3-5 years, be subject to an upgrade programme using the £20M additional funding that was provided by EPSRC (Chapter 5). We expect to see many UK companies getting contracts from this programme and will advertise these opportunities alongside those from ITER and JET.

9.4.1 JET

NIS Ltd, a leading integrated design and build engineering company, supplied a complex bandsaw and jig for the remote removal of wall fixtures during modifications to the JET torus to install the new ITER-Like Wall. Although not of high value, their engagement in JET will place them in good stead for future opportunities, especially in ITER.



Figure 9.3: Bandsaw provided to JET by NIS Ltd.

Many of the work packages relating to the EP2 enhancement programme have now being installed in JET. UK companies such as MG Sanders and Casting Technology International, mentioned in previous annual reports, have played a key role in delivering some of these challenging components to JET.

9.4.2 ITER

From the commencement of the ITER programme to date, over 150M€ worth of work has been secured by UK companies. Companies such as Atkins, Jacobs and Oxford Instruments have secured large contracts; some of these have featured in previous annual reports. During this reporting period we have seen the following new UK companies engaged in the ITER programme.

Energhia, the **Halcrow**-led consortium which includes France's Altran and Spain's Idom, is set to play a major part in the ITER project. Energhia will undertake design checking services, co-ordination of

interfaces, general project management and the supervision of between 15 and 20 construction contracts. With a value of up to €27million (£23 million), the consortium will support F4E for an initial period of six years, with options to extend the contract for a further five years until 2021.

Fusion for Energy (F4E) has awarded **Durham University** a three year framework contract estimated to be worth over 1.5M€ to undertake testing of the superconducting strand for the ITER Toroidal Field and Central Solenoid magnets. The superconducting material for both the Central Solenoid and the Toroidal Field coils is designed to achieve operation at high magnetic field (13 Tesla), and is a special brittle intermetallic made of Niobium and Tin (Nb3Sn).

Cambridge based **Observatory Sciences Ltd**, an SME, won a contract to train the ITER CODAC (Computing and Data Acquisition) team on how to get the best from its EPICS software when building the ITER control system. EPICS (Experimental Physics and Industrial Control System) is a set of Open Source software tools, libraries and applications developed collaboratively and used worldwide to create distributed soft, real-time, control systems for scientific instruments.

Mott MacDonald, teamed with BCF Solutions Inc, has secured a major consultancy framework contract for project management support to ITER. The framework is for five years with the possibility of being extended by a further three. The Mott MacDonald and BCF team will provide project controls support, including scheduling, cost management, configuration controls and technical guidance for the management of procurement.

ARCADIS, a world leading provider of consultancy, planning, architectural design, engineering and management services, has provided Safety and Risk Management expertise for the ITER project.

Other UK companies are well-placed to win work which will hopefully be secured in 2011-12. These include sub-contract opportunities in major (exceeding 100M€) contracts.

9.5 TECHNOLOGY TRANSFER AT CULHAM INNOVATION CENTRE

Over 30 companies are located in the Culham Innovation Centre, which celebrated its tenth anniversary in February 2011. The Centre is part of a network of business incubators managed by Oxford Innovation and is home to a wide range of pioneering technology-focused companies, providing them with a professional infrastructure and image to grow their business, along with a range of business support services needed during the first vital years of operation.

CCFE's Technical Support Package (TSP) continues to assist suitably qualified start-up companies located in the Innovation Centre. Depending on their needs the, TSP can include technical advice or access to engineering, scientific and computing skills and technologies. The TSP has assisted several start-up companies in areas such as product development and problem solving, usually via

the assistance of CCFE's Special Techniques Group. Six companies currently benefit from the TSP and all endorse its value to the growth of their business.



Figure 9.4: Culham Innovation Centre 10th Anniversary event in February 2011.

9.6 PROMOTIONAL ACTIVITIES

9.6.1 FUSION & INDUSTRY WEBSITE AND DATABASE

Registration on the Fusion and Industry database (<http://www.fusion-industry.org.uk/register.asp>) continues to attract new companies. Companies are encouraged to visit the Fusion and Industry website <http://www.fusion-industry.org.uk> which is regularly updated to reflect ITER developments.

As F4E and ITER procurements increase, the CCFE Fusion and Industry team have been busy alerting companies of new opportunities, helping companies to find new partners and when possible, introducing companies to ITER engineers.

9.6.2 FUSION BUSINESS E-ZINE NEWSLETTER

Issues 20 to 25 of the electronic *Fusion Business* e-zine were published during this year, with the primary focus on opportunities to win ITER business and features on UK companies who have successfully won ITER, JET and MAST contracts. Also covered are the activities of the Fusion and Industry team, progress on technology transfer and Culham Innovation Centre activities including the Technical Support Package. Current and back issues of Fusion Business are at: <http://www.fusion-industry.org.uk/newsletter.asp>.

9.6.3 EXHIBITIONS AND EVENTS

Company exhibitions continue to be a successful feature of the Fusion and Industry events programme and demand remains high.

Joint exhibitions in the main Culham foyer by non-competing companies continue to remain very popular, with many of companies requesting a return visit every year. For most companies a tabletop exhibition in the Culham main reception area will suffice, but mobile exhibition trailers can also be accommodated.



Figure 9.5: A company exhibiting in the main Culham foyer.

Exhibitors come from a wide cross-section of industries including precision engineering, motion control, cryogenics, electronics, fibre optic connectors, thermo analytical instruments, pressure regulators and vacuum equipment. In addition to meeting fusion scientists and engineers, exhibitors are able to meet staff from the many technology companies located at Culham Science Centre.

The annual Technology & Innovation exhibition, organised by Nu-Tech Associates, which promotes engineering equipment and associated services to the UK nuclear industry around the country, returned to Culham for its ninth year in May 2010. It attracted a record attendance of over 350 visitors. Thirty-one companies and their products and services were on show. Feedback from exhibitors was very positive, with many commenting that it was an excellent turnout, and a good number of immediate sales enquiries were received.

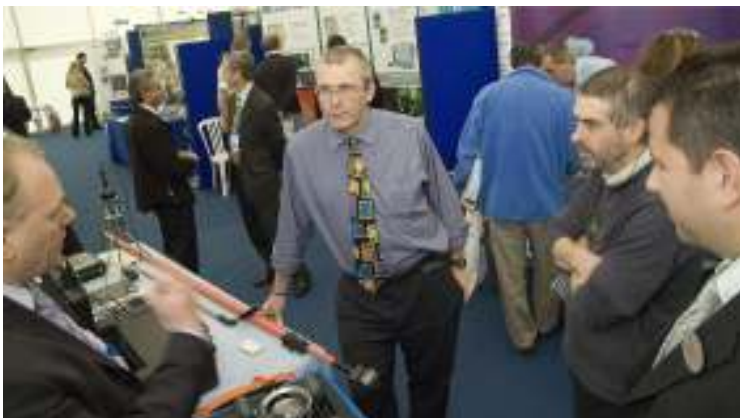


Figure 9.6: Technology & Innovation Exhibition at Culham

9.6.4 BUSINESS OPPORTUNITIES FOR UK PLC FROM FUSION AND ITER EVENT

On 23 September 2010, with support from UK Trade & Investment, CCFE held an event 'Business Opportunities for UK plc from fusion & ITER' at Culham. Presentations were given by representatives from the ITER IO and from F4E and companies such as Atkins, Babcock and Tessella presented their experiences of working on ITER contracts. The presentations are available on-line, at <http://www.fusioniteropportunities.org.uk/>. This event was attended by over 175 people from over 100 companies.

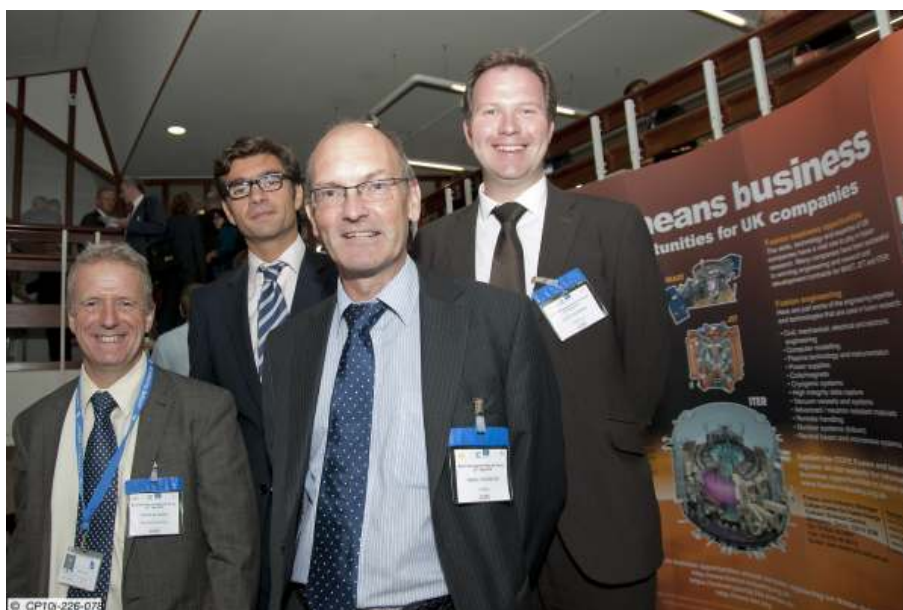


Figure 9.7: David Ellis (Babcock), Benjamin Perier (F4E), Nigel Thornton (Atkins) & Keith Norman (Tessella), speakers at the fusion & ITER event in September 2010.