



Vol 2005 / 2  
April 5, 2005

# newsletter

EUROPEAN FUSION DEVELOPEMENT AGREEMENT

Issued by the EFDA  
Close Support Unit  
Garching

## News

### Competitiveness Council - 7 March 2005

The Council took note of the information given by Dr. Janez Potočnik, Commissioner for Research, on the progress report of the international negotiations relating to the future construction of an international thermonuclear experimental reactor (ITER). The Council will reconsider this question at its next meeting on April 18. For a recorded version of the press conference see our website: <http://www.efda.org> Please find the Conclusions (in French only) on: <http://www.eu2005.lu/en/actualites/conseil/2005/03/07Compet/index.html>

### Commissioner Potočnik opens fusion expo in Ljubljana


On 21 March, the Open Days of the Josef Stefan Institute in Ljubljana (Slovenia) were launched, including an exhibition of European fusion by the European Commission. This exhibition presents interactive exhibits, information and a 3D film on the European research programme on fusion energy. Slovenia (and Poland) will this year sign Contracts of Association which will allow the smooth integration of their fusion research experts into the European programme. "This exhibition and these Open Days reach out to a wider public, showing the importance of fusion energy for our future.", said European Commissioner Dr. J. Potočnik, who was present at the launch. "I hope that this event and others like it will help attract our next generation to science and technology, by showing its usefulness for our daily lives."

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### Commissioner Potočnik visits JET

The European Commissioner for Research, Dr. Janez Potočnik, made his first visit to the JET facilities on 3 March together with Members of Cabinet, Mr. Matjaz Malgaj, Mrs. Charlotte Haentzel and his spokeswoman Mrs. Antonia Mochan. The Commissioner was given a presentation by Prof. Sir Chris Llewellyn Smith (Chairman of the EURATOM Consultative Committee for Fusion, CCE-Fu) on fusion and the Fast Track. Prof. Carlos Varandas (Chairman of the EFDA Steering Committee) presented EFDA and the role of the Associations in the fusion programme followed by a presentation on JET by Dr. Jérôme Paméla (EFDA Associate Leader for JET).

After touring the JET facilities, which included a visit to the Torus Hall, Remote Handling and Tritium Storage facility, Dr. Potočnik addressed about 150 fusion scientists working at Culham. The speech was also broadcasted to other EFDA partners including amongst others CEA Cadarache and the Associations EURATOM-IPP Garching, Lisbon and Prague through the JET computer network system and internet. 

*Continuation page 2*



From left to right:

Prof. Sir C. Llewellyn Smith, Prof. C. Varandas, Prof. A. Bradshaw, Dr. J. Potočnik, Dr. J. Paméla, Prof. M. Q. Tran.

<http://www.efda.org>

Find the full version of the speech at:

<http://europa.eu.int/rapid/pressReleasesAction.do?reference=SPEECH/05/133&format=HTML&aged=0&language=en&guiLanguage=en>

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Speaking about energy, the Commissioner said “(...) we should strive to have a sustainable energy mix. Fusion energy is certainly one of the major elements of this mix that we should be working to place at the disposal of future generations.” He went on to say that “in many respects the European Fusion Programme is a model for the European Research Area. The experience the EU has gained in managing a highly complex scientific and technological programme such as JET gives us confidence to embark, in partnership with the leading fusion programmes throughout the world, on the next step towards the realisation of fusion.” And about ITER he made it clear that “We spared no effort to find consensus among the six negotiating parties to realise ITER at Cadarache. (...) I have proposed to our Japanese partners to sit together and find an acceptable compromise at the high political level.”

A meeting with the chairmen of all Fusion Committees and the EFDA Leadership, led by Dr. Alexander Bradshaw, chairman of the Group of Chairmen (GoC), concluded the afternoon visit.

### The Portuguese Secretary of State for Science and Innovation visited JET

On February 4 the Portuguese Secretary of State for Science and Innovation, Mr. Pedro Sampaio Nunes and the Head of his Cabinet, Mr. Pedro Cardoso e Cunha, visited the JET facility. Mr. Sampaio Nunes was welcomed by Dr. Jérôme Paméla, the EFDA Associate Leader for JET, Prof. Carlos Varandas, the Chairman of the EFDA Steering Committee and Head of the Research Unit of the Association EURATOM Instituto Superior Tecnico (IST), Dr. Frank Briscoe, the Senior Manager of the JET Operations Contract and the members of the Portuguese EURATOM Association currently on the JET site Drs. Paula Belo, Duarte Borba, Bruno Gonçalves, Sebastian Hacquin, Filomena Nave, and Isabel Nunes. An introduction to the European Fusion Programme and EFDA was presented by C. Varandas, while J. Pamela gave a presentation on the role of JET, emphasising its unique capabilities for the preparation of ITER. D. Borba gave an overview of the involvement of IST in JET. The UKAEA fusion activities on the Culham site were described in a presentation by Mr. Frank Briscoe. The presentations were followed by a tour of the JET facility, which allowed the delegation to visit the remote handling facility, the torus hall and the microwave reflectometer diagnostic hardware installed in the diagnostic hall. An upgrade of this diagnostic is being performed under an enhancement lead by the Association EURATOM IST.



*From left to right: Dr. F. Briscoe, Dr. J. Paméla, Mr. P. Sampaio Nunes, Prof. C. Varandas, Mr. P. Cardoso e Cunha, Dr. D. Borba.*

Mr. Sampaio Nunes showed great interest in the fusion programme and in the scientific and technical exploitation of JET under EFDA. He was also very pleased to see the hardware developments carried out in collaboration with IST. Mr. Sampaio Nunes and Mr. Cardoso e Cunha had lunch with the welcoming party where issues raised by the Portuguese young scientists were discussed, such as employment opportunities and career prospects in scientific research. The Portuguese Secretary of State for Science and Innovation was particularly impressed by the participation of IST staff in the JET campaigns and the dedication and enthusiasm shown by the IST scientists working at JET.



*From left to right: Dr. J. Paméla, Mr. P. Sampaio Nunes*

## News

**Fusion in the European Parliament**

In the week of 24-28 of January the European Parliament was the scene of a fusion dinner-debate and an exhibition on ITER and fusion energy. The events were organised by M. Beurskens of the Association EURATOM FOM-Rijnhuizen (The Netherlands), together with K.-H. Steuer and S. Gärten of the Association EURATOM-IPP Garching (Germany).

Almost 90 guests gathered in the Members Salon at the European Parliament on January 25 for a special dinner-debate on the role of fusion in the future energy mix. Among the guests were about 30 members of the European Parliament from many countries, an equal number of distinguished guests from the European fusion community, and a number of representatives of the European Commission, the World Energy Council and the Dutch ministries of Education and Foreign Affairs. The event was hosted by the Dutch MEP Dr. D. Corbey, who also gave the opening and closing addresses, in which she stressed the need to be clear about the return on investment and potential spin-offs of fusion research. Prof. N. Lopes Cardozo, head of fusion research at FOM-Rijnhuizen, acted as chairman. He introduced the energy problems of the modern world in a short speech.

After the starter, Prof. Sir C. Llewellyn Smith, director of the Association EURATOM-UKAEA, addressed the current developments of fusion research and the role of ITER towards sustainable and commercial exploitation of fusion power. He pointed out that fusion is among the very few options that can contribute significantly to a truly sustainable energy system, and that all options require an increased level of funding. After the main course, Prof. J. Li, Director of the Institute of Plasma Physics of the Chinese Academy of Sciences, spoke about China's economic ambitions, and its growing energy needs. "China wants to be among the first nations to employ commercial fusion power," he said. Li explained that at the moment, China is the second largest CO<sub>2</sub> producing country, and already the world second largest oil importer. Li spoke words of praise to the European governments for their far-sightedness in spearheading the development of fusion energy. Between the courses, lively discussions were heard at the dinner tables. The general opinion that arose from the plenary discussion was very supportive of fusion, with questions mainly focusing on matters of finance and spin-off.



*Lively discussion: The sponsor of the dinner-debate, the Dutch MEP Dr. Dorette Corbey, and Prof. Sir Chris Llewellyn Smith*

In the same week that the Dinner Debate was held, an exhibition was held at a central location in the European Parliament. It featured the Fusion Road Show, the ITER model and other Fusion Expo items, and introductory posters. The exhibition was set up and manned by colleagues from the EURATOM Associations UKAEA, ERM, HAS, ENEA, and FOM, together forming a very good representation of the European fusion programme.

The exhibition drew about 400 visitors, among them many MEPs or their assistants. Generally, the visitors were genuinely interested in fusion energy, and engaged in discussion with the crew of the fusion exposition. The general perception was that the energy problem has significantly risen on the political agenda, that people start to realise the full proportion of it, and are quite willing to consider new technologies, in particular fusion. Some 800 Fusion CD-Roms and 400 brochures on fusion were handed out.



*npaio Nunes, Prof. C. Varandas*

Tampere is Finland's second largest city (Population 200,000) located approx. 180 km north of Helsinki and a major centre for research, development, education and industry.

Associations

**Finland launches major initiative in support of ITER remote maintenance**

On the 22 February 2005 VTT Industrial Systems hosted a press conference to announce the launch of a Remote Operation Virtual Reality Centre (ROViR) to be set up in VTT's Tampere site. ROViR is being established as a joint venture between VTT Industrial Systems and TUT IHA (Tampere University of Technology, Institute of Hydraulics and Automation), both located on the same technology campus. The establishment of the ROViR Centre has been strongly influenced by the EFDA Remote Handling (RH) programmes and was triggered by EFDA's decision in October 2004 to locate its new RH test facility, the Divertor Test Platform (DTP 2, see facing page), in Tampere. Formal responsibility for hosting the facility will rest with the Association EURATOM-Tekes. However, day-to-day responsibility for its construction and operation will be carried out by VTT Industrial Systems and TUT IHA, who are members of the Tekes research unit.



*ROViR press conference*

The plan for the ROViR Centre is to develop it into a leading European centre in the field of advanced robotics, remote handling and mobile robotics systems. Initially, the major activities are likely to center around the DTP2, but the ROViR Team have ambitious plans to engage industry and aim to develop into an organisation employing some 100 researchers of which at least 30% should originate outside Finland. The Executive director of VTT Industrial Systems, Jouko Suokas, explained that "As well as serving the remote handling needs of ITER, we want to expand and develop the use of Virtual Reality (VR)

tools throughout industry and help it to meet the dramatic changes in development and design methods likely to occur. In fact, we believe that the use of this technology in manufacturing over the next decade is likely to have an impact of similar magnitude to the CAD / CAM revolution in the 1980's".



*The key persons behind the establishment of the the ROViR Centre and the DTP2 project (from left to right): Arto Timperi (ROViR manager), Martti af Heurlin (Deputy Director general of the Finnish National Technology Agency - Tekes), Jim Palmer (EFDA Responsible for Remote Handling activities), Jouko Suokas (Executive Director of VTT Industrial Systems), Prof. Matti Vilenius (Director of TUT IHA), Mikko Siuko (TUT IHA Responsible for fusion activities), Seppo Karttunen (HRU Association EURATOM-Tekes) and Michael Pick (EFDA Field Co-ordinator Vessel/In-Vessel)*

When asked why EFDA chose Tampere for the DTP2 site, Michael Pick (EFDA Field Co-ordinator) replied: "Apart from the strong working relationship we have developed with Finland over the years, what we have here [in Tampere] is the presence of a stable and well established technical infrastructure within VTT, coupled with a source of young and enthusiastic engineers from TUT. Young engineers who we hope will develop through their experiences with DTP2 to help satisfy the future staffing needs of ITER. A second major point in Tampere's favour was the desire to think beyond the DTP2 itself and seek to create a much larger centre for the development of technologies related to remote handling. This will be good for Europe, good for industry and ultimately good for ITER."

## Associations

### The DTP2 facility

Within the framework of the ITER EDA, the subject of remote exchange of the ITER divertor has almost entirely been dealt with by the EU and the development and supply of divertor remote handling (RH) equipment is expected to be a 100% EU contribution to ITER. Prior to July 1998 the EU's commitment to the topic of divertor handling manifested itself in the construction of the Divertor Test Platform (DTP) at the ENEA Research Centre, Brasimone, Italy. This facility was designed to bring together and demonstrate the main RH activities required for divertor exchange in the ITER'98 machine and in many areas this was successfully achieved. In moving to the ITER 2001 design however, although the general concepts for divertor RH remained intact, the design of most of the divertor handling equipment has significantly changed. For instance, due to dramatic space reductions inside the machine, the simple "trolley-like" radial cassette carriers modeled at Brasimone are now obsolete. Instead, cassettes must be handled in a cantilevered manner using a "Cassette Multifunctional Mover (CMM)" fitted with a number of specialised end-effectors. In response to these significant design changes, it was decided to construct a new divertor RH test facility designated "DTP2" in order to test prototypes of the new ITER 2001 divertor handling devices.

Initially the DTP2 will be configured to demonstrate handling of second cassettes (those located immediately on either side of the access port) using a prototype CMM and Second Cassette End-Effector (SCEE), whose reference design has been developed by TUT (Tampere University of Technology) IHA. Therefore for Phase I operations, the DTP2 facility will comprise a partial vessel mock-up with radial and toroidal rail sections just sufficient to allow central and second cassette operations. The facility will be equipped with a CMM and SCEE prototype plus a cassette mock-up accurately replicating the mass, Centre of Gravity, stiffness and the mechanical interfaces of the real ITER cassette.

Procurement contracts to industry for the supply of the above will be placed during 2005 with the aim of having an integrated system in place by the end of 2006.

During 2007 and 2008 a second phase of DTP2 development is planned whereby the facility will be extended in the toroidal direction to allow for testing of further prototypes, such as the "Cassette Toroidal Mover (CTM)".

Based on the current ITER schedule, the design of the movers for ITER should be frozen during 2009 in order to properly specify the real ITER systems needed for first assembly of the Tokamak in 2013.

For **more information** on ITER Remote Handling see:

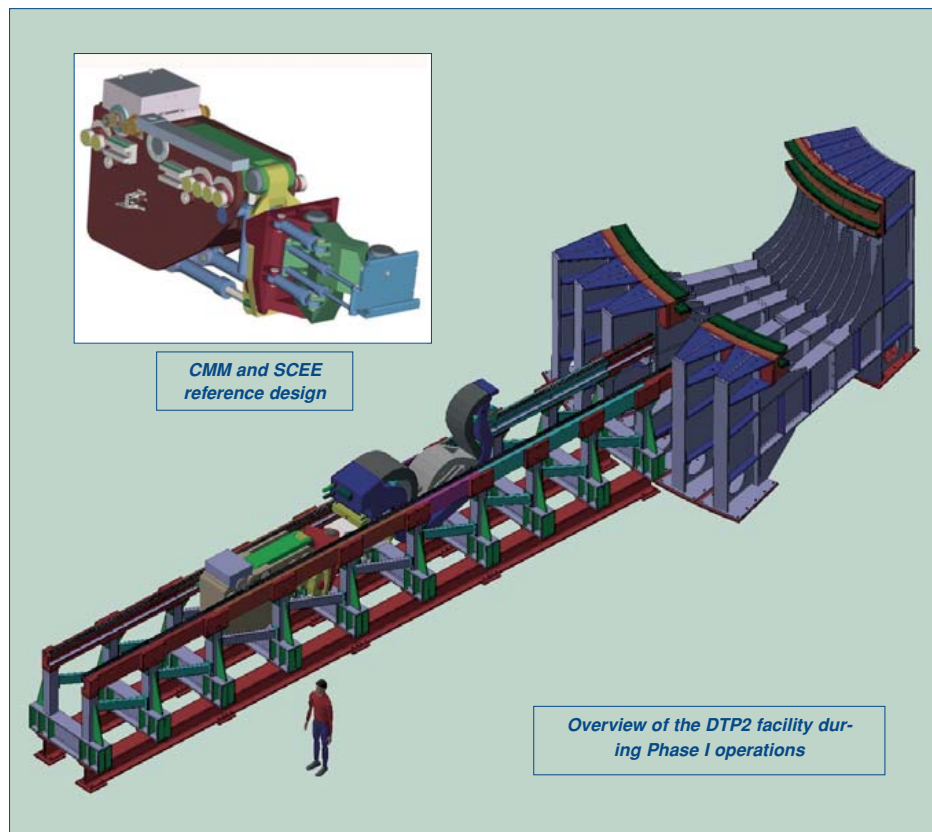
<http://www.iter.org/>  
and follow the path:

- >> [What?](#)
- >> [Design](#)
- >> [Main Features](#)
- >> [Remote Handling](#)

For **information** on real Remote Handling operations inside the JET Tokamak see:

<http://www.jet.efda.org/>  
and follow the path:

- >> [JET](#)
- >> [Remote Handling](#)



CMM and SCEE  
reference design

Overview of the DTP2 facility during Phase I operations

Directors of the Course are  
Drs. F. De Marco and  
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### Course on "Global and local control of tokamak plasmas"

The course, taking place on November 8-14 2005 is aimed at training scientists and engineers by giving an exhaustive presentation of arguments and projects related to control of thermonuclear plasmas. There will be also time for discussions, analysis and comparisons of different lines and solutions in a relaxed and friendly atmosphere. The Course is held in the framework of the "International School of Fusion Reactor Technology" located at the Ettore Majorana Foundation and Centre for Scientific Culture (Erice, Sicily, Italy). The programme of the Course includes the following topics: equilibrium, VDE, disruptions, Current Drive, Neoclassical Tearing Modes, Resistive Wall Modes, ELMs.

In the Course each subject will have lectures dedicated to physics and lectures dedicated to control techniques and experimental results. You can get information on the Course visiting the site <http://www.isfrt-erice.enea.it>.



### 5<sup>th</sup> Public Information Group meeting at CEA Cadarache

The European Union and Japan are still deadlocked over where to build ITER, the world's largest nuclear fusion facility. But the European flag has already been flown on the proposed European ITER site at Cadarache, when the Public Information Officers met to discuss tools and plans to prepare a good understanding for fusion among the European public. On March 2-3 2005 the Public Information Group, consisting of 27 full and part time representatives from the EURATOM Associations and several European Universities, held its annual meeting in the "Château" at Cadarache (France), hosted by CEA under the auspices of EFDA.

In his opening speech Dr. Michel Chatelier, director of the CEA Controlled Fusion Research Department, welcomed the participants and reminded them about their important role to communicate fusion to the public.

During the meeting the attendees debated the PI activities carried out in 2004 and the plans for 2005 and also focused on specific topics, such as ITER, education and the Fusion Expo. Questions were answered and new proposals for the PI strategy were discussed. A large part of the meeting aimed at identifying the main activities due to be launched once the ITER construction is agreed. Lots of tutorial material to support the development of a positive public opinion on fusion has been prepared so far throughout the Associations and EFDA: brochures and booklets in different languages, a CD-Rom, films and video material, the EFDA Newsletter, as well as posters etc.



The EFDA participation in EIROFORUM and the Fusion Road Show, performed by the Association EURATOM-FOM, has been an important issue in the field of education during the last year. Within the EIROFORUM framework EFDA will not only be present at the Science on Stage festival in November 2005, but will also take part in the definition of a new Journal which should address the needs of science teaching across Europe. The Fusion Road Show has proved to be an important tool to communicate fusion in an entertaining way not only to schools, but also to politicians. The attendees agreed that a video version of this show should be prepared to be shown all over Europe at specific fusion events. Many educational activities have been carried out in the Associations so far, like girls days, summer workshops, school visits etc., but the positive message about fusion being part of the future energy mix has to be further communicated to the young generations, to satisfy their will to know.

A powerful tool not only in the education area, but also for the public and the politicians is the Fusion Expo, the successful itinerant exhibition on fusion research run by Consorzio RFX Padova (Italy) on behalf of EFDA. In the year 2004 the Expo stopped in some Eastern European towns, such as Poznan, Krakow, Warsaw, Riga and Sofia and many more are planned in 2005. In parallel to the displays, the Expo is also being fully redesigned in cooperation with external professionals, so that a more modern and appealing look will be available at the end of this year.

A special session of the meeting was dedicated to present the procedures of the Public Debate for "ITER in Provence", which is being prepared by the Association EURATOM-CEA according to a new French law existing since the year 2002. The objective of the debate, which will develop over four months, is to launch an overall discussion on the presence of ITER in the Provence. An independent commission appointed by the "Commission Nationale du Débat Public" (CNDP) will be in charge of surveying this process and provide a final report. The result of the debate, together with the input from the project owners, will be used as basis to get the the final licensing of the plant. It is expected that the public

debate will create a relationship of trust with the population in the four departments close to the ITER site.

The Associations were invited by Jean-Michel Bottereau (CEA) to take more active part in the preparation of the site, contributing with ideas and suggestions to the preparation of the future ITER visitors center.

As a representative from the European Commission Yvan Capouet, head of Unit in Directorate Energy, confirmed the strong support by the Commission for ITER being built at Cadarache. He proposed that the main objectives of PI activities by the associations and EFDA in 2005 should focus on increased public awareness of the ITER project, on the efficient organisation, high cooperation and success stories in the European research programme, and increased participation of industry in the fusion research activities. Mr. Capouet invited the EURATOM Associations and their multinational scientists to play an active role in the process by bringing fusion to the public. At the end of the meeting the European PI officers agreed on CEA being a great host and excellent organiser and they all look forward to seeing ITER in this site.



*Dinner presentation: Yvan Capouet (European Commission, right) and Dr. Michel Chatelier (director of the CEA's Controlled Fusion Research Department)*

The Public Debate on ITER is represented on:

[http://www.debatpublic.fr/debats\\_en\\_cours/liste\\_decisions.html](http://www.debatpublic.fr/debats_en_cours/liste_decisions.html)

For more information on the Fusion Expo please see:

<http://www.efda.org>  
 >> Events  
 >> Fusion Expo



*Public Information Group opens the ITER site at Cadarache - well, only for this photo ...*

## Events

### Fusion Road Show nominated for European Descartes Prize



The Fusion Road Show of Prof. Niek Lopes Cardozo (Association EURATOM FOM-Rijnhuizen, The Netherlands) has been nominated as one of the five finalists in the category "Innovative action for science communication" of the Descartes Prize for Science Communication. Beginning in 2004, the prize - with a total of 250.000 prize money - will be awarded yearly by the European Union for outstanding science communication actions, with the aim of stimulating broader public understanding about science and research. The prize ceremony was held on the 2 of December last year in Prague, in the presence of Dr. Janez Potočnik, EU commissioner for Science and Research, and Mr. Václav Klaus, President of the Czech Republic. In the "innovative action" category, the prize was won by a Hungarian initiative to help schoolchildren get involved in research. Among the prizewinners in other categories was zoologist and broadcaster Sir David Attenborough, for his pioneering work in the field of wildlife filmmaking.

Find **more information** on the Fusion Road Show on (in Dutch):

<http://www.fusie-energie.nl/roadshow.htm>

You would like to book the Fusion Road Show? Please contact Mark Westra on:

[m.t.westra@rijnh.nl](mailto:m.t.westra@rijnh.nl)

**EFDA Brochures in different languages**

Fusion Energy, ITER, JET, - these are topics you would like to know more about? Our EFDA brochures have been available in English so far and have been updated now. Because of a great demand some of them were also translated into other languages. All brochures can be ordered online as a paper version by contacting [federico.casci@efda.org](mailto:federico.casci@efda.org), but you can also download them in PDF format from our website <http://www.efda.org> >> Downloads >> Brochures

"JET - The Joint European Torus - A European Success Story": English only  
 "ITER - A brighter outlook to future energy": English only  
 "Cleaner energy for the future": Dutch, English, Finnish, French, German, Italian, Spanish (soon also in Portuguese, Hungarian, Polish and Czech)

For more information see our EFDA website:

<http://www.efda.org>  
 and additionally  
<http://www.jet.efda.org>  
<http://www.iter.org>

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