

## NEWS ALERT

# Test Platform for International Fusion Project Inaugurated

## Prototyping for ITER Starts

**29 January 2009  
Tampere, Finland**

The start of the prototyping for the international fusion project ITER was made today at Tampere in Finland. European scientists and industry officially inaugurated the ITER Divertor Test Platform Facility (DTP2). The ITER Divertor cassette is one of the most important components inside the ITER reactor. It is the only component that is allowed to touch the hot plasma, extracting the fusion "helium ash" and keeping the plasma clean. Maintenance of this critical component can only be performed remotely with machines developed specifically for the purpose. In Tampere, the first Cassette Multi Functional Mover, will be tested on DTP2 situated in the VTT Technical Research Centre of Finland. The completion of this facility marks an important step forward in the development of the ITER project, the world's biggest and most ambitious science experiment ever for the demonstration of a possible new source of clean energy.

DTP2 has been completed thanks to the collaboration of scientists from all over Europe and four industrial partners from Finland, Luxembourg and Spain. The design and manufacture of this core prototype has taken four years under the management of Euratom and the Fusion research centers through the Euratom Fusion Development Agreement. Its overall cost amounts to €7M, half of which was financed by the Euratom program. Now it is the joint responsibility of Fusion for Energy (F4E) - the European Union's organisation responsible for providing Europe's contribution to ITER, and the Euratom Association TEKES, comprising the Tampere University of Technology (TUT) and VTT, to test and develop the specifications for the real ITER remote handling equipment.

DTP2 is the first full size remote handling prototype for ITER. Many more are required with many opportunities for industry to learn the diverse component requirements of Fusion reactors. The know-how from these developments will stimulate spin-offs in different innovation areas, reinforcing Europe as a pole of scientific excellence in research on fusion as well as attracting the best talent from all over the world. More than 1000 companies across different Member States of the European Union have registered in the industrial database of F4E and have expressed their interest to be part of the ITER experiment. Most major European industry players specialised in engineering and nuclear R&D are on board. This makes the ITER project a major industrial program with spin-offs expected to be comparable to the European Organization for Nuclear Research CERN, where 38% of technology contracts produced new products for the market.

### What is ITER?

ITER is an experimental reactor which will reproduce the physical reaction - fusion - that occurs in the sun and stars. The project aims to demonstrate the scientific and technological feasibility of fusion as an energy source. The reactor is actually being constructed in Cadarache, France. This will lay the basis for a demonstration power plant, (called DEMO), the last step leading to the commercialisation of fusion power.

Europe is hosting ITER and is its largest investor. The European Union is going to contribute 45,46 % of the construction costs while the other six partners will contribute equally to the rest. The 7th Euratom Research Programme (2007 – 2011) provides almost 2 billion Euros to fusion research.

### What is Fusion for Energy (F4E)?

Fusion for Energy is the European Union's organization responsible for providing Europe's procurements and 'in kind' contribution to ITER. It will also support fusion R&D initiatives through the Broader Approach Agreement signed with

Japan and prepare for the construction of demonstration fusion reactors. Fusion for Energy was set in April 2007 for a period of 35 years. Its offices are located in Barcelona, Spain.

### **What is fusion?**

When the nuclei of light atoms come together at very high temperatures, they fuse and they release enormous amounts of energy- this is the power source for our sun and stars. To produce fusion on earth, one must heat gas to around 100 million degrees Celsius in a "cage" made by strong magnetic fields which prevent gas from escaping. The development of fusion science and technology has been the basis of the European fusion program.

### **Further background information on the DTP2 facility:**

The Divertor System is one of the most important internal components of the ITER machine. It is the only component that is allowed to contact the hot plasma and its primary function is to remove the "helium ash" and thus control the plasma purity.

The main element of the DTP2 facility is the full scale ITER Divertor mock-up, a large structure that replicates the geometry of the lower part of ITER's vessel and one radial port. The facility aims to test and demonstrate all the remote handling operations of the ITER divertor, providing the necessary input to the final specifications.

The DTP2 facility also offers an exclusive insight of the Cassette Multi-functional Mover (CMM) prototype running on a 20 metres long structure and weighting 65 tonnes, which will be required to transport the ITER divertor cassettes, weighting 10 tonnes, along rails until they reach ITER's plasma chamber.

The detailed design and manufacture of the CMM prototype was carried out by the Spanish company Telstar (Tecnologia Mecanica S.L.). VTT Systems Engineering and Tampere University of Technology, both members of the Finnish fusion association Tekes, have constructed the mock-up facility to replicate a section of the ITER Divertor region. The structure comprises elements manufactured by companies in Finland (TP-Konepajat Oy) and Luxembourg (Gradel S.A.).

Scientists from Tampere University of Technology have been developing and testing the software necessary to control the CMM while it was still being designed and constructed in Spain. This was achieved by linking the control hardware, supplied by Procon Systems S.A., Spain, to a virtual model of the CMM.

The DTP2 operator control system is equipped with the latest virtual techniques generated through cameras and graphical computer models that replicate the process of ITER's remote handling system.

### **More information online:**

European Commission

[http://ec.europa.eu/research/energy/fu/fu\\_cpa/fu\\_pa\\_iter/article\\_1241\\_en.htm](http://ec.europa.eu/research/energy/fu/fu_cpa/fu_pa_iter/article_1241_en.htm)

F4E

[www.fusionforenergy.europa.eu](http://www.fusionforenergy.europa.eu)

ITER

[www.iter.org](http://www.iter.org)

Euratom Fusion Development Agreement

[www.efda.org](http://www.efda.org)

VTT

[www.vtt.fi](http://www.vtt.fi)

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