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F4E collaborates with IDOM on high tech ITER systems

A multimillion contract for engineering integration of many state of the art instruments that will measure the biggest plasma generated by a fusion device has been signed between Fusion for Energy (F4E), the European Union organisation managing Europe's contribution to ITER and IDOM ADA, the Advanced Design and Analysis division of IDOM, a multinational company specialising in engineering, architecture and consultancy services based in Spain.

The value of the contract is in the range of 20 million EUR and is expected to run for at least four years. IDOM ADA will work with instrument designers in several public European fusion laboratories as well as experts in Japan, India, China and the US to deliver designs for the systems integration. Professor Henrik Bindslev, Director of F4E, emphasized that "through this contract we are seeing a clear example of knowledge transfer from laboratories to industry. Europe's contribution to ITER, has been a catalyst encouraging the two poles of knowledge and competitiveness to work closer. A new chapter in the field of Diagnostics is opening that will help us analyse the ITER plasma, monitor it and improve our understanding of physics". Mr. Fernando Querejeta, President of IDOM, stated that "we are very proud of the opportunity that we have been given to collaborate in what most likely will be the most important research project of the XXI century in the field of energy and engineering. This contract is another big step in our already important activity as science system providers for large scientific installations and instruments".

The role of Diagnostics in ITER

The Diagnostics system will help us understand what exactly will be happening in the machine during the fusion reaction. Thanks to it we will be able to study and control the plasma behaviour, measure its properties and extend our understanding of plasma physics. In simple terms, the system will act as the eyes and ears of the scientists offering them insight thanks to a vast range of cutting edge technologies. ITER will rely on approximately 50 diagnostic instruments that will offer experts an unparalleled view of the entire plasma and ensure the smooth operation of the machine. Given the duration of the plasma pulse, which will be 100 times longer than any fusion device currently in operation, the strong fluctuation levels and the extreme environment in the vessel, the diagnostic system will act as the guardian of the safe and sound operation of ITER.

Europe is responsible for roughly 25% of all Diagnostics in ITER.

The scope of this contract

This contract will deliver a comprehensive engineering design integrating around 20 diagnostics instruments into five of the ports giving access to the ITER plasma. In-vessel metallic containers will also be designed through this contract in order to protect the diagnostic equipment from the fierce plasma temperatures that may reach 150 million °C, and shield other parts of the machine from neutron radiation. The metallic shields will weigh between 5 tonnes and 20 tonnes each and will have to cope with extreme conditions like the high vacuum, colossal electromagnetic forces and high heat fluxes. In addition, other structures will be designed to house diagnostic instruments that will

be mounted onto the Divertors cassettes of the machine, and even outside the vacuum vessel, as well as specialist flanges providing water and electrical connections to the diagnostic instruments whilst preserving the ITER vacuum.

Background information

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Fusion for Energy

Fusion for Energy (F4E) is the European Union's organisation for Europe's contribution to ITER.

One of the main tasks of F4E is to work together with European industry, SMEs and research organisations to develop and provide a wide range of high technology components together with engineering, maintenance and support services for the ITER project.

F4E supports fusion R&D initiatives through the Broader Approach Agreement signed with Japan and prepares for the construction of demonstration fusion reactors (DEMO).

F4E was created by a decision of the Council of the European Union as an independent legal entity and was established in April 2007 for a period of 35 years.

Its offices are in Barcelona, Spain.



<http://www.fusionforenergy.europa.eu>



<http://www.youtube.com/user/fusionforenergy>



<http://twitter.com/fusionforenergy>



<http://www.flickr.com/photos/fusionforenergy>

ITER

ITER is a first-of-a-kind global collaboration. It will be the world's largest experimental fusion facility and is designed to demonstrate the scientific and technological feasibility of fusion power. It is expected to produce a significant amount of fusion power (500 MW) for about seven minutes.

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 safe, limitless and environmentally responsible energy source.

Europe will contribute almost half of the costs of its construction, while the other six parties to this joint international venture (China, Japan, India, the Republic of Korea, the Russian Federation and the USA), will contribute equally to the rest.

The site of the ITER project is in Cadarache, in the South of France.

<http://www.iter.org/>

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