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F4E and Siemens collaborate to develop powerful heating system for ITER

ITER will be the biggest-ever fusion device generating a plasma whose volume will be close to 840 m³ at 150 million ° C, ten times the temperatures at the core of the sun. To achieve these temperatures we would need powerful heating systems using high-energy beams, in order to push together the nuclei and trigger off a fusion reaction.

F4E, the European Union organisation managing Europe's contribution to ITER, and Siemens, the global powerhouse operating in more than 200 countries, have started to collaborate on the development of three units of equipment that will host power supplies, whose requirements go beyond present industrial practices, as part of the ITER Neutral Beam Injectors (NBI), one of the ITER heating systems. One unit will be manufactured for a research facility operating in Italy, whose aim is to help scientists test the NBI components before they go into production mode for ITER. The other two units will be manufactured as part of the ITER powerful NBI system, designed to deliver 33 MW of power in order to inject neutral particles to the core its super-hot plasma. The works are expected to last seven years and their overall value will be in the range of 18 million EUR. Pietro Barabaschi, F4E acting Director, explained that "through this collaboration, a European global innovator will contribute to the largest international collaboration that is expected to influence the future energy mix". Michael Krohn, Project Manager for High Voltage Decks and High Voltage Bushings at Siemens, stated that "our company is proud to be part of this international research project and to play an active role in the construction of units for the ITER Neutral Beam Injectors. We look forward to a fruitful collaboration".

The scope of the contract:

Through this contract Siemens will design, manufacture and test three High Voltage units to contain the power supplies of the NBI high energy beams that will heat up the ITER plasma. Similarly, the High Voltage bushing assemblies, connecting the power supplies to the transmission lines, procured by Japan's Domestic Agency for ITER, will also be delivered through this contract. Following the successful completion of the factory acceptance tests, the components will be shipped and installed to different locations. The first unit will be delivered to the Megavolt ITER Injector and Concept Advancement (MITICA) facility in Padua, financed by F4E, Japan's Domestic Agency for ITER and Italy's Consorzio RFX, the host of the infrastructure where the NBI tests will be carried out. The other two units will be delivered to ITER, in Cadarache, where they will be integrated in with the other components of the NBI power supply system.

Think of the High Voltage decks as air insulated Faraday cages, distributed over two floors and covering a surface of 150 m². They will contain transformers, power distribution systems, and control cubicles weighing approximately 45 tonnes. The entire box with its structure will reach 100 tonnes and will stand on tall post insulators more than 6 metres high above the floor. The units will be manufactured in line with the seismic requirements applying to the respective installation

locations (Italy/France). The bushing design also presents a degree of novelty due to the very high voltage insulation levels (1 MV) in a compact structure using SF6, a potent greenhouse gas used as electric insulator. Siemens, responsible for the manufacturing of the bushing assembly, and Hitachi, responsible for the production of the transmission lines, will have to collaborate closely so that their components fit together in a seamless manner in order to operate.

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 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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