Fusion for Energy signs contract for ITER Winding Packs

Fusion for Energy has signed a contract that will amount 156 million Euros for the supply of ten winding packs for the ITER Toroidal Field (TF) Coils with a European consortium of companies bringing together Iberdrola Ingeniería y Construcción SAU, ASG Superconductors SpA and Elytt Energy SL. Europe will manufacture 10 of the 19 TF Coils for ITER, including a spare one, while Japan is responsible to produce the remaining nine. The signature of the contract is a significant step for the ITER project and an impressive technological milestone given the fact that winding packs of this size have never been manufactured before.

What is the function of winding packs in the ITER device?
The ITER device will operate with a system of superconducting magnets which relies on the Toroidal Field Coils, the Central Solenoid, the Poloidal Field Coils and the Correction Coils (see ITER image).
Toroidal Field coils are "D" shaped coils whose core task in the ITER device is the confinement of plasma. They are composed of a winding pack and a stainless steel coil case. Each winding pack is 14 metres high, 1 metre wide and 9 metres long. The weight of a winding pack is approximately 110 tonnes, which compares to that of a Boeing 747. Every winding pack consists of a set of 7 double pancakes, stacked together and electrically connected in a series for an operating current of 68,000 Amps. Each double pancake is made of one radial plate, a D-shaped special grade stainless steel plate in which the conductor is embedded (see Winding Packs image).

The TF coils will be manufactured with a technique where the conductor will be first wound, subsequently heat treated at 650°C and finally transferred into the grooves of the radial plates. In order to be able to fit the conductor in the radial plate grooves, the conductor will have to be wound with a precision of few tenths of a milimetre over several meters, which is considered as one of the most critical steps in the production of the double pancakes modules.

Europe is the only ITER party so far that has manufactured a superconducting magnet using this technology with a magnet that was three times smaller than the actual ITER TF coil.
Scaling up this technology is not only a big challenge in ensuring its performance but also a breakthrough for fusion.

The contract for the winding packs is phased in three stages. First, a full size prototype of the double pancakes module, which is the most complex component of the winding pack, will be manufactured. Then, upon successful completion of the prototype, the first winding pack will be manufactured and finally, the remaining nine winding packs will be manufactured.

Background information

MEMO: Fusion for Energy signs contract for ITER Winding Packs

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/

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.
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 Members 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 at Cadarache in the South of France.
http://www.iter.org/default.aspx

For media inquiries contact:

Aris Apollonatos + 34 93 3201833