ITER coming up out of the earth

The domestic European agency Fusion for Energy is now preparing the next major operations due to start over the next six months on the ITER construction site.

After the two year development operations undertaken by Agence Iter France and by the ITER construction site in Cadarache, the domestic European agency Fusion for Energy (F4E) is doubling their efforts for the next phase of works on the site.

The criteria for the construction of the ITER site are due to start in March 2010 with the construction of a 32 metre cubic metres of material from an area of approximately 120 metres by 100 metres. The foundations for the ITER building will be laid here, requiring an area of approximately 120 metres by 100 metres. A work force of about thirty will be needed for this task.

The second task is scheduled for May to June 2010 and involves the construction of a building 32 metres long, 45 metres wide and 15 metres high. This building will house the equipment necessary for winding the enormous 24 metre diameter steel cold iron, with superconducting radiation-cabinet. A total of about fifty people will be working on the site on tasks ranging from foundations and roofing to the development of the design. The site will have to work round the clock in 2011. Finally, at the end of 2012, preparation will start on the construction of a new superconducting magnet which will complete the ITER research complex.

The ITER construction site will be needed for this task. As well as the visits, there are models, planning documents, and road maps showing the extent of the works already undertaken and the work that is to be completed in the future. To organise a visit and a site tour, you simply need to call.

Visit the ITER construction site!

The summer, both the inhabitants of neighbouring towns and villages and students in the region made the most of the long sunny days to visit the ITER construction site. During the July and August, nearly 40 of the visits were organised for private individuals. As well as the visits, there are models, planning documents, and road maps showing the extent of the works already undertaken and the work that is to be completed in the future. To organise a visit and a site tour, you simply need to call.

The ITER construction site

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The development and construction of the international ITER project in Cadarache is regulated by nearly 70 different legal entities from 35 different countries. The additional partners of ITER, such as the ITER Organization, the European Industrial Association, the ITER Domestic Agencies and the ITER site in Cadarache, have identified 13 main areas of responsibility for the ITER construction site. These areas include: civil engineering, operations, equipment, maintenance and cleaning, and security.

The ITER construction site is the largest technical project of the ITER Organisation. It is the only ITER site that is not a National Stockyard but is a European facility, the ITER construction site will be completed in September 2010 at the same time as the completion of the second phase. More than 1,600 people are working on the site.

With regard to the works on the development of the future site of the ITER research facility, there have been more than 2,000 people on the past two years, mostly workers (72%) and 28% from the region. The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.

The ITER construction site is the first of the international ITER project in Cadarache, which is regulated by nearly 70 different legal entities. Thanks to the ITER construction site in Cadarache, the ITER Organisation and Fusion for Energy are now preparing the next major operations due to start over the next six months on the ITER construction site.
Plasma or ionised gas

When the temperature of a gas is sufficiently high (around a thousand degrees for air, the molecules lose one or two electrons), the gas is then said to be in an ionised state. In a tokamak, this process is brought about by a huge number of collisions between deuterium and tritium ions, resulting in the creation of electrons and ions of helium. The tokamak is described as ‘toroidal chamber with magnetic coils’.

In geometry, a torus is a surface of revolution with a circular cross-section, so the tokamak is essentially a doughnut-shaped chamber. When the tokamak’s magnets are turned on, the toroidal chamber is divided into a number of annular regions (toroidal flux surfaces), which contain the plasma. The shell of the reactor is made of a superalloy that contains between 10 and 12 percent of chromium. This metal is characterized by high resistance to electric currents. With this technology it is therefore possible to increase the temperature in the heart of the plasma.

A magnetic vessel

The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.

From Torus to Tokamak

In geometry, a torus is a surface of revolution generated by revolving a circle around an axis situated in its plane. To approximate this definition, an air chamber also has a more or less circular cross-section. The design of tokamak facilities such as those at Cadarache is therefore known as ‘toroidal chamber with magnetic coils’.

From Tore Supra to the ITER Organisation

The ITER organisation was formed in 1985 to tackle the issues of confinement and deuterium-tritium plasma heating mainly by helium produced by fusion reactions and producing ten times more energy than that present in an average star. Deuterium and tritium are a mixture of deuterium and tritium (an element present in heavy water). When these two nuclei collide, they fuse, and this process is now used in the heart of the machines such as the Tore Supra in Cadarache, JET in England, JT60 in Japan, SULT in India, EAST in China and KSTAR in South Korea. Having inherited such developed technologies from around the world, ITER will be using the biggest coils ever to be used in Tokamak facilities that anything it comes into contact with will simply vaporize. Hence, finding a way to contain plasma has long been a priority of ITER’s scientific research.

Pushed to extremes

Technologies using very low temperatures are also used to study other gases, in this case, the gases in the plasma. With such temperatures it is possible to feed the heart of the plasma by injecting frozen deuterium at very high speed. Whilst very low temperatures are required for fusion, extremely high temperatures are needed to produce the heat of the plasma by injecting frozen deuterium at very high speed. In this case, the gases in the plasma are then used to study other gases, in this case, the gases in the plasma. In order to study other gases, in this case, the gases in the plasma.

An Outlined View of the ITER Vessel

The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.

A Three Tiered Structure

ITER, the product of an international partnership with countries of the United States, the Russian Federation, India, Japan, the Republic of Korea and the European Union, is set up on a three tiered organisation. The international organisation (ITER Organization) is responsible for the design, assembly and operating of the research facilities. It constitutes the national agencies (the members of the ITER Organization and their families).

From the ITER Organization to the ITER Vessel

The ITER vessel will be made up of several components and is expected to be carried out in 2010. A For the ITER vessel, the current cost is about 30km per hour. At Tore Supra and Cadarache, they will be light-toned, the slowest of which will travel at a speed of just 3km per hour and the fastest at about 30km per hour.

From the ITER Vessel to the ITER facility

A magnetic vessel

In geometry, a torus is a surface of revolution generated by revolving a circle around an axis situated in its plane. To approximate this definition, an air chamber also has a more or less circular cross-section. The design of tokamak facilities such as those at Cadarache is therefore known as ‘toroidal chamber with magnetic coils’. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.

Pushed to extremes

Technologies using very low temperatures are also used to study other gases, in this case, the gases in the plasma. With such temperatures it is possible to feed the heart of the plasma by injecting frozen deuterium at very high speed. Whilst very low temperatures are required for fusion, extremely high temperatures are needed to produce the heat of the plasma by injecting frozen deuterium at very high speed. In this case, the gases in the plasma are then used to study other gases, in this case, the gases in the plasma.

An Outlined View of the ITER Vessel

The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.

Pushed to extremes

Technologies using very low temperatures are also used to study other gases, in this case, the gases in the plasma. With such temperatures it is possible to feed the heart of the plasma by injecting frozen deuterium at very high speed. Whilst very low temperatures are required for fusion, extremely high temperatures are needed to produce the heat of the plasma by injecting frozen deuterium at very high speed. In this case, the gases in the plasma are then used to study other gases, in this case, the gases in the plasma.

An Outlined View of the ITER Vessel

The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.

Pushed to extremes

Technologies using very low temperatures are also used to study other gases, in this case, the gases in the plasma. With such temperatures it is possible to feed the heart of the plasma by injecting frozen deuterium at very high speed. Whilst very low temperatures are required for fusion, extremely high temperatures are needed to produce the heat of the plasma by injecting frozen deuterium at very high speed. In this case, the gases in the plasma are then used to study other gases, in this case, the gases in the plasma.

An Outlined View of the ITER Vessel

The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.

Pushed to extremes

Technologies using very low temperatures are also used to study other gases, in this case, the gases in the plasma. With such temperatures it is possible to feed the heart of the plasma by injecting frozen deuterium at very high speed. Whilst very low temperatures are required for fusion, extremely high temperatures are needed to produce the heat of the plasma by injecting frozen deuterium at very high speed. In this case, the gases in the plasma are then used to study other gases, in this case, the gases in the plasma.

An Outlined View of the ITER Vessel

The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields. The vessel is a hot, dense ball of plasma. During fusion, the hydrogen atoms which are the nuclei main components fuse into helium and the fact that plasma tends to repel each other means that the helium nuclei are in a state known as the ‘virtual box’ created using a skillful application of magnetic fields.