



F4E NEWS

Fusion for Energy Magazine

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ITER Worksite

Discover how the site has been completely transformed

Components

Europe has manufactured the most high-tech magnet in history

Components

ITER Vacuum Vessel manufacturing accelerates

Events

ITER shines bright at EXPO 2017

Stakeholders

European Commission releases new communication on ITER



Inside Europe's facility where ten of the ITER Toroidal Field coils are being manufactured - La Spezia, Italy

Europe celebrates its leadership in magnets technology!

The world's most sophisticated high-tech superconducting magnet is made in Europe. It is 14 m high, 9 m wide and weighs 110 T—as much as a Boeing 747! This is the first of the 18 Toroidal Field (TF) coils that will operate in ITER, the biggest fusion machine that will demonstrate the potential of this energy source.



The most high-tech magnet in history manufactured with the contribution of F4E and its industrial partners - ASG Facility, La Spezia, Italy

The coils will create a powerful magnetic cage that will entrap the fusion fuel which is expected to reach 150 million ° C. When powered with 68 000 A, the ITER TF coils will generate a magnetic field that will reach 11.8 Tesla—about 1 million times stronger than the magnetic field of the Earth! Europe will manufacture nine of them, plus one spare. The other nine will be fabricated in Japan.

To celebrate this landmark achievement, F4E together with ASG Superconductors, Iberdrola Ingeniería y Construcción, Elytt Energy, CNIM, SIMIC and the ICAS consortium, participated in a small ceremony which brought together 80 representatives from industry, stakeholders and the media. At least 600 people from 26 companies have been involved in Europe's share of TF coils. ITER has given European industrial partners

a one-of-a kind opportunity to extend their know-how, employ and train workforces, and identify potential markets in the field of superconductivity.

Davide Malacalza, Managing Director of Hofima SpA and Chairman of ASG Superconductors, opened the event giving a warm welcome to all guests by offering an overview of the group's activities. ASG counts a collaboration of more than 50 years with EU research centres. The company has become a pioneer in magnets technology and has managed to retrain its staff by being involved in scientific and medical projects. Massimo Federici, the mayor of La Spezia, congratulated the people involved in this milestone and stressed the economic effects stemming from the industrial facility for the city and the region. The transformation of this

facility has also been addressed by Edoardo Rixi, regional councilor of Liguria for industry, who explained that equipping people with new skills helps us to unleash their potential and that of the region.

Bernard Bigot, Director-General of ITER Organization, praised the collaboration of all companies and described ITER as a project full of opportunities for big and smaller economic operators. The need to generate a sustainable energy source and the challenges posed by climate change require a global alliance in line with what ITER proposes. Johannes Schwemmer, Director of F4E, presented the merits of fusion energy, elaborated on Europe's contribution to ITER and focused on Italy's record in the production of ITER components commenting on the strong involvement of its industry.



Davide Malacalza, Managing Director of Hofima SpA and Chairman of ASG Superconductors presenting the work of ASG



Edoardo Rixi, Regional Councilor of Liguria for Industry



Johannes Schwemmer, Director of Fusion for Energy, explaining Europe's contribution to ITER



Bernard Bigot, ITER Director-General of ITER Organization, congratulating Europe for this achievement



Representatives of F4E and ITER Organization together with Europe's industrial partners (ASG Superconductors, CNIM, Elytt, Iberdrola Ingeniería y Construcción, ICAS, SIMIC) at the facility where ten of the ITER Toroidal Field coils are being manufactured - La Spezia, Italy



Representatives of the F4E and ASG workforces at Europe's ITER Toroidal Field coils facility, La Spezia, Italy

Through their interventions, the representatives of the different companies helped the audience to comprehend the different phases of manufacturing and the challenges they faced along the way. This impressive achievement results from various contracts starting with the production of a 20 km conductor for the TF coils, involving ICAS, the Italian Consortium for Applied Superconductivity consisting of ENEA, Criotec Impianti Srl and TRATOS Cavi SpA. Antonio della Corte, President of the ICAS consortium and Head of ENEA Superconducting Laboratory, explained that "our contribution to the superconducting conductor for the ITER magnets allowed us to develop new ideas which improved our production technologies and use them in different applications."

ASG, Iberdrola Ingeniería y Construcción and Elytt, have used parts of this conductor to manufacture Europe's first TF coil magnet. A vast new facility, which used to be the site of a washing machines factory, has been constructed and has become a hub of expertise by retraining its original workforce and installing state of the art equipment. Stefano Pittaluga, ASG Superconductors, stated that "thanks to ITER, and our company's leadership in fusion magnets technology, we now see new possibilities of growth in the energy sector. We are ready to use this knowledge in new industrial applications." And in fact ASG has contributed to some of the most

advanced magnetic resonance imaging (MRI) equipment used in healthcare to study the human brain.

Andrés Felipe, Project Manager of Iberdrola Ingeniería y Construcción, explained that "by being part of ITER, a project which will test the energy of the future, we have been given the opportunity to demonstrate our know-how and in return acquire further expertise in engineering." For Aitor Echeandia, CEO of Elytt, the commercial benefits have been concrete. "Because of our involvement in the manufacturing of ITER magnets, our SME has acquired further competences in superconducting technologies for fusion and particle accelerators."

SIMIC and CNIM have been involved in the production of the 70 radial plates of the magnet, the metallic structures that support the insulated conductor in their grooves before the structures are laser welded, wrapped with insulating material, and impregnated. Both companies have upgraded their facilities, employed people and trained them to deliver their share of components respecting a tight schedule. Marianna Ginola, SIMIC Commercial Manager, explained that "we have managed to grow as a company and improve both in terms of project management and in technical aspects." According to Philippe Lazare, CEO of CNIM Industrial Systems Division, "in order to manufacture our share of ITER

components we had to upgrade our industrial facilities, establish new working methods and train new talent. In return, we have become a French reference in high-precision manufacturing for large components."

The first magnet will be transferred to SIMIC to perform a series of tests. Then, it will be inserted into a massive case, welded, impregnated by resin and machined using the most advanced technologies, special tooling and one of the largest machines in Europe. Each TF coil will weigh over 300 T and will be transported via sea from SIMIC to the site of the ITER project.

During the event, a guided tour in ASG was organised offering all guests the possibility to view the different tooling stations and magnets in progress. For Alessandro Bonito-Oliva, F4E Manager of Magnets, and his team, this has been an accomplishment of significant importance. "Thanks to our determination and the excellent collaboration between F4E and its partners we have completed the core of Europe's first TF coil. This is the result of the good cooperation between the different parties of this one-of-a kind project. A clear proof that when Europe wants to be a pioneer-Europe can!" he stated.

If you would like to take a virtual tour in the facility visit F4E's [Facebook page](#) or use the [Roundme application](#).



(L-R) Aris Apollonatos (F4E), Alessandro Bonito-Oliva (F4E), Antonio della Corte (ICAS), Philippe Lazare (CNIM), Stefano Pittaluga (ASG), Paolo Barbero (SIMIC) during the panel discussion.



(L-R) Stefano Pittaluga (ASG), Neil Mitchell (ITER Organization), Bernard Bigot (ITER Organization), Alessandro Bonito-Oliva (F4E), Johannes Schwemmer (F4E) during the guided tour in the facility commenting on the terminations of the winding pack.