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Europe's final ITER Vacuum Vessel sector delivered

Fusion for Energy (F4E) in collaboration with Ansaldo Nucleare, Westinghouse Electric Company, and Walter Tosto, have completed manufacturing Europe's final vacuum vessel sector for ITER - the largest international fusion experiment. The component which left the factory of Westinghouse, Monfalcone, Italy, was safely transported by DAHER, to the ITER site, Cadarache, France. The arrival of the sector marks the end of a manufacturing journey which started 16 years ago and is officially the last large ITER component delivered on-site.

The sector's fabrication builds on years of work directly involving more than 150 professionals, and at least 15 companies across Europe with their respective workforces. F4E, managing Europe's contribution to ITER, which amounts to nearly half of the project, has successfully created with its industrial partners a first-of-a-kind supply chain underpinned by expertise, and the capacity to manufacture complex components for future fusion reactors.

Thanks to the optimal use of resources, rigorous project planning, and the application of good manufacturing practice, Europe delivered all of its five sectors in the last two years. F4E innovated by using AI in order to cross-check data collected by technical teams in the factories.

The vacuum vessel is key to the operation of the ITER device. The massive double-walled container made of stainless steel will house the fusion reaction. It will provide a clean environment keeping away air, dust or impurities from entering its chamber. Powerful superconducting magnets will embrace the vessel, so that the plasma floats without touching its walls. The component counts nine sectors. Europe has produced five of them and the Republic of Korea the remaining four. Once joined, the component will be 19.4 m in diameter, 11.4 m high and weigh approximately 5200 tonnes. It has also undergone very detailed inspections to comply with strict standards set by France's Nuclear Safety Authority.

Marc Lachaise, Director of Fusion for Energy (F4E) praised the achievement which resulted from the collaboration between all parties, identifying it as the foundation of their success. "Europe's final sector results from the strong partnership between F4E, the consortium of Ansaldo Nucleare, Westinghouse, and Walter Tosto. We worked as one team, in an integrated manner with ITER Organization, and built on the lessons learnt from ITER Korea in producing the rest of the sectors. Our commitment to deliver and the resilience of our teams have brought us to the finish line. It's a high-tech component made in Europe, by European companies, at a time when knowledge and expertise matter in the fusion race. Thanks to the EU's involvement in ITER, F4E together with companies, is shaping the potential of fusion energy."

According to Daniela Gentile, CEO of Ansaldo Nucleare, "The delivery of the fifth and final vacuum vessel sector manufactured by the consortium represents the culmination of a great journey of commitment, innovation, and industrial collaboration and excellence. We are proud to have contributed to one of the world's most ambitious scientific programmes, demonstrating the

capability of European industries to deliver highly complex technologies that will support the advancement of fusion energy.”

For Luca Oriani, President of New Plant Delivery, Westinghouse, “Delivering this vacuum vessel is a significant achievement for Westinghouse and our consortium partners. Our Monfalcone teams have worked toward this milestone for many years, and we look forward to applying their experience to future projects of similar scale around the world.”

Luca Tosto, CEO of Walter Tosto commented on the significance of this milestone. “The ITER project has represented an industrial and technological challenge of extraordinary value for Walter Tosto. We worked on components that are unique, in an environment where the technology itself was evolving. It was this complexity that helped us to grow and shaped our capabilities for the years to come. The knowledge, technology and expertise will always be a part of our industrial heritage.”

It took more than 2 million hours to produce Europe’s five sectors, counting in total 750 km of welding beads. The production of segments, the four parts that make a sector, was carried out in Westinghouse, Monfalcone, and in Walter Tosto, Chieti. Once the segments were assembled, they were welded to become one sector. Then, the component was transported by sea and land to reach the ITER site -the final destination.

Background

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 also supports fusion R&D initiatives through the Broader Approach Agreement signed with Japan; it contributes to IFMIF-DONES hosted in Spain 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 headquarters are in Barcelona, Spain.

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

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