Press Release

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Central Components for the World's Largest Fusion Experiment Complete

MAN Energy Solutions finishes pre-assembly of two giant components for international 'ITER' project' fusion reactor

MAN Energy Solutions has successfully assembled two further core-components for the world's largest fusion experiment "ITER" (Latin: "the way") in Cadarache, southern France. In addition to the already-completed 'Lower Cylinder', the new components, 'Base Section' and 'Upper Cylinder', are central to the construction of the cryostat – the largest stainless steel, high-vacuum chamber ever built – which will form the exterior of the fusion reactor. When fully assembled, the cryostat will be 30 m tall with a volume of 16,000 m³.

"We recived the ITER-order for the assembly of the cryostat in 2015 and are very proud – with the 'Base Section' weighing 1,350 tonnes – that we have been able to successfully assemble the heaviest single component of the entire project," said Norbert Anger, Site Manager of MAN Energy Solutions in Deggendorf, where the ITER project is mainly managed within the company. "For the installation, our employees used specially developed welding processes on-site, which once again showcased our know-how in the complex processing of stainless steel".

With the 'Base Section' and 'Upper Cylinder' completed, the construction of the fourth and final component of the cryostat – the so-called 'Top Lid'– can now begin with MAN Energy Solutions once again responsible for assembly and welding work. Assembly of the four individual sections is scheduled for late-summer 2020.

International megaproject in southern France

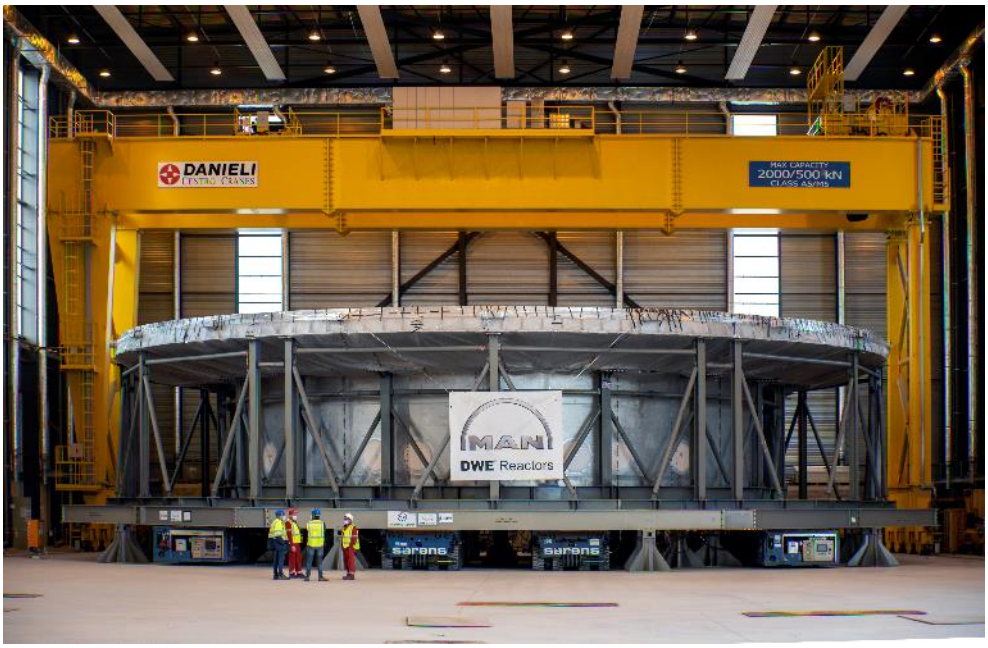
A total of 35 nations are working on the ITER project to build the world's largest tokamak: a fusion reactor operating on the principle of magnetic confinement.
The facility is intended to demonstrate that nuclear fusion can be a realistic and CO2-free energy source of the future. The heart of the tokamak (acronym of the Russian translation: "Ring chamber with magnetic coils") is a vacuum vessel in which the atomic nuclei of hydrogen isotopes – deuterium and tritium – fuse into helium. The enormous heat generated by this process will be used to generate energy and mimics the principle by which the sun and other stars function. One gram of fusion plasma contains the energy of approximately twelve tons of coal. Ultimately, ITER will operate with just three grams of fusion plasma and generate 500 MW of thermal power.

The cryostat forms the envelope of the ITER machine and provides the ultracold, vacuous environment necessary for the superconducting coils and vacuum vessel to work. In total, the cryostat consists of 54 individual elements produced by Indian company, Larsen & Toubro, and are assembled on the construction site by MAN Energy Solutions. "It is a special honour for us to be involved in the most ambitious

energy project in the world. We are helping to bring the source of solar enery to earth and thus generate CO2-free energy in huge quantities. This project unites the world community and has the potential to revolutionize energy production," added Anger.

First fusion plasma planned for 2025

Construction work on the site of the ITER project began in 2012, with the construction of the reactor house starting two years later. The assembly of the ITER machine in the reactor building will begin in late-summer 2020. With the assembly of the cyrostat, MAN Energy Solution is involved on a core component. According to current plans, the fusion reactor will generate the first plasma in 2025, with the full experiment scheduled to begin in 2035.



MAN Energy Solutions has successfully assembled two further core-components for the world's largest fusion experiment "ITER". The 'Base Section' weighing 1,350 tonnes is the heaviest single component of the entire project.

The ‚Upper Cylinder' leaving the assembly hall at the ITER site in in Cadarache, southern France.

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.