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JT-60SA Program Contribution to Fusion Energy

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JT-60SA is a highly-shaped large superconducting Tokamak under construction by EU and Japan. The mission of JT-60SA is to support ITER and to complement ITER towards DEMO by resolving key physics and engineering issues. Fabrication and installation of components of JT-60SA by EU-Japan Integrated Project Team are progressing on schedule towards the first plasma in Sep. 2020. On the Cryostat Base made by CIEMAT, the 340-gegree-part of the Vacuum Vessel (VV) has been placed and welded accurately by QST. By Feb. 2018, all 18 TF coils have been manufactured and cold-tested by ENEA and CEA and 14 TF coils have been assembled to the tokamak by QST. Manufacture of all 6 EF coils have been completed by QST. Commissioning of the cryogenic system was completed by CEA in Naka. High Temperature Superconducting current leads have been delivered by KIT. Commissioning of the power supply system (ENEA, RFX, CEA and QST) has also been implemented smoothly. The Cryostat Vessel Body has been delivered by CIEMAT.
The JT-60SA Research Plan (SARP) ver. 3.3 was issued in March 2016 by 378 co-authors (JA 165 (16 institutes), EU 213 (14 countries, 30 institutes): Using ITER- and DEMO-relevant plasma regimes and its sufficiently long discharge duration, JT-60SA enables studies on all the key physics issues for ITER and DEMO. From ~2030, the first wall will be changed from carbon to full tungsten-coated carbon. By integrating these studies, the project provides 'simultaneous & steady-state sustainment of the key plasma performances required for DEMO'. Such JT-60SA research activity includes consolidation of a "Plant Simulator". As for the first plasma and heating experiments, JT-60SA will start earlier than ITER by five years. Therefore, experiences and achievements in JT-60SA are expected to contribute to reliable operation of ITER.

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