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Recent Progress of JT-60SA Project

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The JT-60SA project has been promoted since June 2007 under the framework of the Broader Approach (BA) agreement and Japanese national fusion programme for an early realization of fusion energy by conducting supportive and complementary work for the ITER project and directing DEMO design activity. With the powerful and varied deposition profile of heating and current drive system, flexible plasma shaping capability and various kinds of in-vessel coils to suppress MHD instabilities, JT-60SA is sure to play an essential role to address essential issues to achieve long sustainment of high beta_N burning plasmas expected in DEMO. Components and systems of JT-60SA are procured by the implementing agencies (IAs): Fusion for Energy in EU and JAEA in Japan. Their design, fabrication, installation and commissioning have been actively directed and supervised by the IAs. As of the end of 2015, twenty-seven procurement arrangement (PAs) have been concluded covering 95% of the values of in-kind contribution for JT-60SA. In spite of the size, components of JT-60SA have been manufactured well within the tolerance of 1 mm order. EU procures TF coils, most of the power supply systems, cryogenic system, cryostat and so on. The cold test of the first TF coil with a nominal current of 25.7 kA at 4.5-7.0 K was successfully carried out. JA procures EF coils, Central Solenoids, Vacuum Vessel, thermal shields, heating system, diagnostics system and so on. Vacuum Vessel sectors were welded on the cryostat base forming a 340° torus. The heating systems (P-NBI, N-NBI and ECRF) has been conditioned to be operated at their full power (41 MW in total) for 100s. The first plasma of JT-60SA is scheduled in 2019. Wide range of operational region of JT-60SA kept in mind, the JT-60SA research plan (SARP) has been regularly updated on the basis of intensive discussion among European and Japanese researchers. The latest SARP (version 3.3) open to the public in March 2016 shows that wide operational region of JT-60SA covers that of recent European and Japanese DEMO designs. DEMO oriented researches such as study of ECRF assisted startup, investigation of non-inductive current overdrive scenario using TOPICS code were added. This paper summarize the recent progress of JT-60SA Project pushed forward by close collaboration of EU and Japan.

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