Design and engineering overview of the Alborz Tokamak

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The Alborz tokamak project has been in the phase of construction at the Amirkabir University of Technology, Iran, since 2012. The completion of this new fusion experimental device fabrication accomplished recently and the start of its commissioning phase is scheduled for the near future. To this end, the initial system tests are now being in process to achieve the plasma with optimal design conditions. In this initial phase of the Alborz tokamak operation, the design purpose is to achieve a 20 kA plasma current with 20 ms duration. The 0.45 m major and 0.15 m minor radii of this tokamak leads to the allowed amount of 3 to the aspect ratio. In addition, the toroidal magnetic field at the axis is 0.85 T, which seems to be appropriate for a medium size tokamak. In this study, the main features of the Alborz Tokamak engineering design, including magnetic field systems, vacuum system and supporting structures have been addressed in detail and several key engineering progress and modifications of the current underway works have been elaborated.