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ITER Construction and Manufacturing Progress Toward First Plasma

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ITER reached in November 2017 completion of 50% of the work required to achieve First Plasma. Progress is most visible in the completion of many key buildings, such as the tokamak assembly building, the cryogenic plant, and the magnet power supply building have been completed. The tokamak building will be ready for equipment in 2020 and the bioshield is already to full height. Key systems begin commissioning in 2018, including the steady-state electric network and the component cooling water, while the cryogenic system and magnet power supply commissioning begins in 2019. Thus, the physical plant is moving rapidly toward completion, and key systems are entering the commissioning phase. Manufacturing progress is equally impressive. The base and lower cylinder of the cryostat have been assembled on the ITER site. Three of the six poloidal field coils and the first of the six modules of the central solenoid are being wound or finished. The winding pack and casing for the first toroidal field magnet are complete and verified to meet the high tolerances required (<0.5 mm). The parts for the first vacuum vessel sector have been fabricated and demonstrated to meet strict tolerances (<1 mm). Therefore, the major components of the tokamak have passed into the fabrication phase. The Heating and Current Drive systems (NB, ECH and ICH) are also in the final design phase. The progression of ITER operation from First Plasma (FP) to the achievement of the $Q = 10$ and $Q = 5$ project goals has been formalized in a Staged Approach. This is a stepwise installation of components and auxiliary systems; all systems will be installed before the start of the fusion power operational phase. The ITER Research Plan has been revised in 2017 to be consistent with the systems available in each phase.

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