

Metrology for ITER Assembly (P2-G-127)

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The overall dimensions of the ITER Tokamak and the particular assembly sequence preclude the use of conventional optical metrology, mechanical jigs and traditional dimensional control equipment, as used for the assembly of smaller, previous generation, fusion devices. This paper describes the state of the art of the capabilities of available metrology systems, with reference to the previous experience in Fusion engineering and in other industries. Two complementary procedures of transferring datums from the primary datum network on the bioshield to the secondary datums inside the VV with the desired accuracy of about 0.1 mm is described, one method using the access directly through the ports and the other using transfer techniques, developed during the co-operation with ITER/EFDA. Another important task described is the development of a method for the rapid and easy measurement of the gaps between sectors, required for the production of the customised splice plates between them.

The scope of the paper includes the evaluation of the composition and cost of the systems and team of technical staff required to meet the requirements of the assembly procedure. The results from a practical, full-scale demonstration of the methodologies used, using the proposed equipment, is described.

This work has demonstrated the feasibility of achieving the necessary accuracies for the successful building of ITER.