

Study for Manufacturing of ITER TF Coil Radial Plates (P1-E-128)

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During the previous design phase of ITER the ITER Toroidal Field Model Coil (TFMC) has been built to verify the TF coil concept of ITER and to proof the feasibility of an industrial fabrication of such a coil. In April 2004, Forschungszentrum and BNG, started a Manufacturing Study for the full scale Radial Plates (RP) of the TF Coils in the frame of an EFDA task. The main part of the Study was to develop feasible concepts of the technology for the manufacturing of the Full Scale Radial Plates starting with the raw material until final testing. The Feasibility Study has covered all manufacturing steps that are necessary for production of the RP. It has included as well a basic layout for the manufacturing process.

During the work several proposals for the single manufacturing work steps have been developed. After that an evaluation of the found proposals has taken place. The most feasible proposals have been combined to manufacturing concepts. Finally two main Concepts were elaborated and evaluated:

Concept 1 includes the premachining of segments with grooves, the welding of the segments and the final machining of the RP.

Concept 2 includes the welding of not machined small segments to the D-shape of the RP and the following machining of the surface and grooves.

Both Concepts will be described in detail with a comparison of tooling and manufacturing details, achievement of technological requirements as well as with the requirements coming from the overall time schedule. Based on the results of the assessment of the different concepts and manufacturing techniques Concept 1 shows some advantages compared to Concept 2. These will be described in the paper. In addition a proposal about additional R&D in front of the later manufacturing will be made.