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P2.151 Initial integration concept of the DEMO lower horizontal port

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The realization of a Demonstration Fusion Power Reactor (DEMO) to follow ITER, with the capability of generating several hundred MW of net electricity and operating with a closed fuel-cycle is viewed by Europe and many of the nations engaged in the construction of ITER as the remaining crucial step towards the exploitation of fusion power. The DEMO machine has three main entrance levels to the plasma chamber. According to the current DEMO reference configuration the vacuum vessel (VV) has 16 vertical upper, horizontal equatorial, and horizontal lower ports, respectively.
This article introduces the initial integration concept of the lower port that has been developed considering the external space constraints, the neutron shielding requirements of the superconducting coils, and its functions. These consist in supporting the VV, hosting different systems in particular the torus vacuum pump and feeding pipes of in-vessel components (IVCs), and to allow for divertor remote maintenance. The size and position of the lower port are constrained by the adjacent TF and PF coils. At the same time the lower port drives the layout of the cryostat and the tokamak building.

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