

FUSION DEVELOPMENT FACILITY

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A Fusion Development Facility (FDF) is proposed by General Atomics to fill the technological gaps between ITER and a Fusion DEMO. FDF is a steady state copper, water-cooled coil machine with a primary goal to testing multiple blanket configurations in its lifetime. For efficient remote exchange of the breeding blankets, it is planned to exchange them through vertical motions in large segments. Two principal remote handling approaches are under study, one exchanging large rings and the second poloidal wedge sections. For either scenario, a joint is required in the toroidal coils to allow for the vertical blanket exchange. Two approaches to making the joint are under study along with the respective structural models for reacting the magnetic loads. Initial stress analysis is reported showing the structural feasibility of either concept. Coolant flow is important in such a steady state device and manifold and piping layout concepts are developed as part of the remote handling study. The base machine design parameters are reported including size and cooling requirements. The different machine configuration options are presented which consider the design aspects for the machine including alignment of the first wall and divertor, coolant access, and exchange of the blankets.

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