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Recent DIII-D Research in Support of ITER* M.R. Wade, DIII-D National Team, *GA* – The DIII-D research team has made several recent contributions that are impacting the design of key components for ITER. Using criteria determined from recent DIII-D experiments showing the importance of island overlap in the edge, researchers have evaluated various non-axisymmetric coil configurations for ITER. DIII-D experiments have established criteria for stabilization of the most serious instabilities in ITER: resistive wall modes (RWMs) and neoclassical tearing modes (NTMs). Analysis suggests that a small level of toroidal rotation is sufficient to stabilize RWMs even at $\beta_N = 4$. DIII-D experiments were instrumental in the choice of an improved ECCD mirror design for ITER, enabling the ability to simultaneously stabilize the $m = 3/n = 2$ and $m = 2/n = 1$ NTMs with ~10 MW in ITER. Recent studies on DIII-D simulating the current ramp phase in ITER indicate a risk of peaked current density profiles and an associated susceptibility to vertical instability. Results of other research on disruption mitigation using massive gas injection and on the choice of plasma facing materials in ITER will also be presented.

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