Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Analysis of Options for Resistive Wall Mode Control Coils for ITER M. ULRICKSON, SNL — Several fusion devices have found improvement in plasma performance from the application of either static or dynamic magnetic perturbations from a set of coils. DIII-D has found that static fields can prevent formation of locked modes and create ergodic structures in the plasma edge that decrease the size of ELMS. They have also used such coils in a feedback loop to control the growth of resistive wall modes. Similar effects have been observed on NSTX, C-Mod, ASDEX, and JET. In all cases, the coils were placed close to the plasma either inside the vessel or immediately outside a thin vessel. Because ITER is a burning plasma device with a long pulse length, thick nuclear shielding must be placed between the plasma and the vacuum vessel. If ITER is to realize the confinement and operation benefits of resistive wall mode control coils, locations and coil designs must be found where such coils can be deployed. Two generic locations have been identified. The most accessible location is immediately outside the vessel and around the mid-plane ports. An alternative location closer to the plasma is inside the mid-plane ports but behind the port shield module. We have used an electromagnetic modeling code to evaluate both the static and dynamic field perturbations at the plasma edge for both of these coil options for frequencies from 1 Hz to 6kHz. *Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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Date submitted: 20 Jul 2006 Electronic form version 1.4