

Abstract Submitted
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Physics Requirements for the ITER Plasma Control System J.A. SNIPES, Y. GRIBOV, A. WINTER, ITER Organization — The Plasma Control System (PCS) on ITER will control the evolution of the plasma parameters necessary to operate ITER throughout all phases of the discharge including plasma termination following off-normal events and plant system faults. The PCS is composed of six closely coupled subsystems that control specific physical quantities comprising: 1) wall conditioning and tritium removal, 2) plasma axisymmetric magnetic control, which includes plasma initiation, inductive plasma current, position, and shape control, 3) power and particle flux control to the first wall and divertor, 4) plasma kinetic control, including fuelling, non-inductive plasma current, plasma pressure and fusion burn control, 5) non-axisymmetric stability control, which includes sawteeth, edge localized modes (ELMs), neoclassical tearing modes (NTMs), error fields and resistive wall modes (RWMs), Alfvén eigenmodes, etc., and 6) disruption mitigation and controlled plasma termination. The PCS is the first of a three layered system for machine protection that will decide the course of action to take following off-normal events or plant system faults during plasma operation together with the Central Interlock System (CIS) and the Central Safety System (CSS) for safety related events. Only if the PCS cannot control the plasma within specified operating limits and conditions will the disruption mitigation system be triggered by the CIS.

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