

Abstract Submitted
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Conceptual Design of the ITER Plasma Control System J.A.

SNIPES, ITER Organization — The conceptual design of the ITER Plasma Control System (PCS) has been approved and the preliminary design has begun for the 1st plasma PCS. This is a collaboration of many plasma control experts from existing devices to design and test plasma control techniques applicable to ITER on existing machines. The conceptual design considered all phases of plasma operation, ranging from non-active H/He plasmas through high fusion gain inductive DT plasmas to fully non-inductive steady-state operation, to ensure that the PCS control functionality and architecture can satisfy the demands of the ITER Research Plan. The PCS will control plasma equilibrium and density, plasma heat exhaust, a range of MHD instabilities (including disruption mitigation), and the non-inductive current profile required to maintain stable steady-state scenarios. The PCS architecture requires sophisticated shared actuator management and event handling systems to prioritize control goals, algorithms, and actuators according to dynamic control needs and monitor plasma and plant system events to trigger automatic changes in the control algorithms or operational scenario, depending on real-time operating limits and conditions.

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