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Work-flow process from simulation to operation for the Plasma Control System for the ITER First Plasma.

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The ITER Plasma Control System (PCS) is an essential component for ITER operations. It will include multiple controls loops as well as a number of support functions dedicated to providing input control parameters and distributing commands to actuators. In addition, a supervisory system within the PCS architecture will manage the orchestration of the PCS control loops during the discharge as well as an Event Handling system to react to real-time changes in the plasma and/or in the plant systems. To investigate and develop controllers and supervisory techniques, a simulation platform is being developed aiming at supporting the staged evolution of the PCS. The PCS Simulation Platform (PCSSP), based on Matlab/Simulink, is used to design and assess PCS control functions and verify the consistency of the PCS architecture. Moreover, the PCSSP is planned to assist in the implementation of PCS algorithms, directly deploying PCS code on the ITER Real Time Framework (RTF).

This paper will present the overall work-flow processes from control simulations, control assessment, code generation, interfaces and deployment into the RTF and PCS commissioning. This will include interface management and co-ordination with ITER investment protection, the pulse scheduling system, and the plant system configuration during operations. How the entire preparation process will be managed, for ITER first plasma operations, will be reported here.

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