

THE NEWLY CONSTRUCTED EPICS-BASED CONTROL SYSTEM FOR KSTAR TOKAMAK DEVICE

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Abstract

The KSTAR is the newest superconducting tokamak to have a mission to perform fusion researches for future energy source, which accomplished the 1st plasma in 2008 after the completion of design, fabrication and assembly since 1995. The KSTAR integrated control system (KICS) aimed at integration of all plant system I&S, development of schema for tokamak operation and relevant S/W, achievement of synchronized operation, and machine protection. For those purposes, we elaborated on the selection of a middleware for the KICS focused on performance, reliability and maintainability, and finally decided to use EPICS. In addition, the KICS adapted several open-source tools in the fields of data management and user interfaces such as MDSplus, Qt, Mysql, etc. For the initial operation, we integrated 17 types of plant systems with various H/W platforms and installed about 200 controllers to handle about 18,000 Process Variables. This paper focuses on the development of the KICS and the operational results. Moreover, the evaluation of EPICS for tokamak control is explained by analyzing the differences between tokamak and accelerator control.

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