ARCHITECTURAL DESIGN OF KSTAR PLASMA CONTROL SYSTEM USING EMBEDDED METHOD

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The KSTAR plasma control system (PCS) has been designed using the object-orientedmethodology. We use both the top-downstyle (ROOM) and the bottom-up style (UML)analysis/design methods. ROOM is used for the total system design of the distributed PCS and is the main stream of the design. UML is used for the design of sub-systems of PCS. The real-time equilibrium reconstruction code for the tokamak plasma, rtefit developed for the DIII-D tokamak, controls plasma position and shape for KSTAR. The task of the rtefit is to compute the distributions in the R,Z plane of the poloidal flux (y) and the toroidal current density (Jt) which provide a least squares best fit to diagnostic data and which simultaneously satisfy the model given by the Grad-Shafranov equation in less than 5 ms. In this study, we demonstrate the down-sizing rtefit in order to fit it into an embedded system for the real-time controller. The ObjectTime software package is used for the analysis and also design tools. The Windriver Tornado is also utilized for the real-time OS.