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Standardization of ITER Instrumentation and Controls based on Hardware Catalogs

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The engineering challenge of the ITER procurement model is to maintain the schedule of-over 170 Plant System delivery, commissioning and integration in order to assure cost-effective construction with timely transition to the operation phase. The standardization of the components used in construction plays a vital role to reach these objectives.
The CODAC Division is addressing the Instrumentation and Controls (I & C) standardization through an ITER baseline document, called Plant System Design Handbook (PCDH) which collects together the requirements and the mandatory procedures. The PCDH does not define required hardware specifications but rather addresses the mandatory industrial standards; the most important from the I/O point of view being the PCI Express and Ethernet interconnect.

The PCDH Document is supported by numerous satellite documents which are each addressing the specific requirements or procedures by linking them with real-life I & C implementations using common engineering terms. The ITER I & C hardware catalogs are PCDH satellite documents which collect together Commodity off the Shelf (COTS) I & C components which are validated and recommended by the CODAC Division. The Slow Controller catalog is listing validated PLC devices which are designated to be used in control loop in 10 ms range. The Fast Controller catalog lists numerous PCI Express and Ethernet enabled I & C devices in PXIe, ATCA and MTCA.4 form factors to deal with fast I & C problems covering the application range all the way up to the ITER Diagnostics Plant Systems. Third catalog is listing the network equipment to be used within the I & C systems.

Summary

The most important items in the ITER I & C Hardware catalogs will be presented. Real-life examples of how these components will efficiently used will be provided by explaining the proposed design of an ITER Plant System I & C.

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