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Technical proposals for the IGNITOR control, data access and communication system

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The control, data access and communication system (CODAC) designed to solve the tasks of planning, preparing and conducting the experiment, collecting, processing and complex analysis of the experimental results at the IGNITOR tokamak fusion project.

It is proposed to build CODAC based on modern failsafe dual-redundant industrial equipment manufactured by National Instruments, Schneider Electric, Siemens, Highland Technology, Hewlett-Packard, GE Fanuc etc. Cross-system interaction provided by high-speed fiber-optic networks: Reflective Memory, MXI-Express, Ethernet network and pulse synchronization with a few microseconds time delay. The high level of Fast Systems (the control loops above the 100 Hz) based on Mathlab Simulink RT (Linux operation system) and National Instruments Labview RT: plasma control system, central safety system, coil power supply system, diagnostics etc. The high level of Slow Systems (the control loops are slower or equal of 100 Hz) based on Wonderware InTouch: auxiliary process systems i.e. vacuum system, cooling water system etc. IGNITOR CODAC should provide synchronized real-time high throughput data processing, high reliability, availability, maintainability and access to experimental data for remote participants through the unified protocol via Internet.

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