

CONTROL AND PROTECTIVE SYSTEM FOR A PLASMA FOCUS INSTALLATION

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The paper presents a control and protective system (CPS) for the plasma focus installation IPF-4/5A having the following main parameters: 1MA plasma current and 40kJ energy stored at 20 kV charging voltage. CPS was designed to operate in a very harsh environment due to high voltages (pulsed or dc), high currents with very high derivatives, intense radiation (neutron and hard X-rays) pulses. CPS provides the personnel and apparatus protection against dangerous events and centralized controls of all protection devices and plasma focus device subassemblies. In order to prevent any electromagnetic coupling between the fusion installation and CPS, the latter is detached from the former by a galvanic separation barrier consisting of fiber optic cable assemblies for analogic signals and low-stray capacitance transformers for logical signals. CPS applies 23 interlocked logical commands, acquires and processes 28 logical states, acquires, processes and displays continuously the main slow time varying signals coming from IPF-4/5A assemblies. All the fusion installation sequences are governed by strict hard and soft interlocking using in parallel two control and protective systems: one based on PC-control methods and another based on classical control techniques.