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DESIGN AND IMPLEMENT CONTROL SYSTEM OF HIGH VOLTAGE PULSE POWER SUPPLY

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The high voltage pulse power supply is the important components in HL-2A tokamak device which provide the direct-current (DC) energy to auxiliary heating system. The high voltage pulse power supply is build based on pulse step modulation (PSM) in HL-2A. The performance of the PSM power supply control system will directly affect the result of the auxiliary heating system, including the study of the physical characteristics of the plasma. The alternative-current (AC) voltage is provide by pulse motor generator set which have many loads operating at different times, so when a loads is running output AC voltage of the pulse motor generator set will be disturbed. In order to obtain good control performance pulse width modulation (PWM) control technology is adapted to control PSM power supply. The whole control system of PSM power supply is consists of programmable logic controller (PLC), close loop feedback control system which is realized based on NI software and hardware, RT operation system (OS), fault detecting system and measurement. Except of PLC all signals are transmitted by optical fiber to ensure the reliability and anti-interference ability of the control system. The new control system has been used in the experiment; the results show that pulse step modulation, high efficient frequency of the output, short protection time (less 5ms), high output power and high reliability can be achieved.

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