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Thu-Mo-Po4.02-01 [7]: Design and Implementation of Interlock System for CFETR CSMC Testing Platform based on FMEA

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The Central Solenoid Model Coil (CSMC) of the China Fusion Engineering Test Reactor (CFETR) is currently in the manufacturing process. After the manufacturing completed, the CSMC will be test on the testing platform. This platform consists of several subsystems, in order to keep the system safe and to avoid any failure possible to damage CSMC magnet during the experiment, we have designed the interlock system. Failure Mode and Effects Analysis (FMEA) are introduced help us to find potential failure mode of subsystem, and according to the FMEA OSD (Occurrence Severity Detection) marks, the system failure will be divided into three levels. Also there is one interlock strategy for each failure level, when a critical failure occurs, the related subsystems will receive the interlock signal and lock the system or initiate fast ramp down sequence. The hardware of interlock system is based on industrial PLC and the communication protocol is OPC UA. Design and implementation details will be described in the paper.

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