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P4.084 Design a Suitable Test Scheme for Triggering Bypass Protection Test of ITER PF Converter Unit

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The external bypass, as an important components of the international thermonuclear experimental reactor (ITER) poloidal field converter unit (PFCU), will provide a freewheeling loop for the load current to protect the magnets and PF converter modules from being damaged by over-current and over-voltage under fault conditions. The triggering bypass protection test is used to verify that the designed bypass is triggered normally and endure the rated load current. In this paper, a suitable test scheme is designed for triggering bypass protection test of ITER PFCU based on the PF converter integrated test platform at ASIPP. This test scheme includes the triggering bypass method, calculating the trigger angle of the converter in inverter and a method of reducing the bypass current to zero in the absence of ITER mechanical switch. The feasibility of the test scheme is successfully verified by the simulation results and test results, both of which prove that the external bypass of ITER PFCU is triggered normally and withstands the load current for 100ms. Due to the integrated inductance of the actual DC output circuit, the actual transfer time of bypass current in the test is more than the simulation results.

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