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Operation Analysis of Impulse Current Mode on ITER High Power DC Test Platform with SVC System

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The ITER Poloidal Field (PF) converter is comprised of four converter bridges, DC reactors, DC switches, etc. and most are non-standard. To evaluate the performance of these equipments, an ITER high power DC test platform has been built to carry out the rated current test and impulse current test. The latter is significant to verify the fault suppression capability of product. The DC test platform can output the rated 400 kA impulse current. The principle design and structure of the DC test platform is introduced in this paper. In addition, the impulse current test procedure is also discussed. The transient large current in impulse current test can produce huge impact reactive power, which impacts the fundamental reactive power and power grid voltage drop. The effect is analyzed by theoretical calculation and simulation. In order to suppress the transient effects of reactive power, a Static Var Compensator (SVC) system is added, which consists of Thyristor Controlled Reactors (TCR) and Fixed Capacitors (FC) with rated compensation capacity 83.2 Mvar. An impulse experiment is implemented on test platform with SVC system. The results of theoretical calculation, simulation and experiment are compared, which demonstrate that the SVC system is effective in compensating impact reactive power and it also performs well on inhibiting the power grid voltage drop.

Eligible for student paper award?

No

Author: Mr WANG, Xudong (Institute of Plasma Physics, Chinese Academy of Science)

Co-authors: Prof. XU, Liuwei (Institute of Plasma Physics, Chinese Academy of Science); Prof. FU, Peng (Institute of Plasma Physics, Chinese Academy of Science); Dr WU, Yanan (Institute of Plasma Physics, Chinese Academy of Science); Mr MAO, Huafeng (Institute of Plasma Physics, Chinese Academy of Science); Mr LI, Jun (Institute of Plasma Physics, Chinese Academy of Science)

Presenter: Mr WANG, Xudong (Institute of Plasma Physics, Chinese Academy of Science)

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