

Tests Design and Models Validation for the Acceleration Grid Power Supply Conversion System of the MITICA Test Facility

Mattia Dan, Loris Zanotto, Claudio Finotti, Mauro Perna, Hans Decamps, and Daniel Gutierrez
IEEE Trans. Plasma Sci., **48**, 6, (2020) 1681; <https://doi.org/10.1109/TPS.2019.2961168>

Abstract:

The acceleration grid power supply (AGPS) of Megavolt ITER Injector and Concept Advancement (MITICA) test facility for the ITER Neutral Beam Injector (NBI) is a special system with demanding requirements (voltage -1 MV dc and power about 55 MW). The procurement of the AGPS has been divided in two parts: the medium-voltage switching power conversion system part and the high-voltage part. The splitting has required the separation of the acceptance tests for each individual scope of supply, i.e., one part had to be tested and accepted without using the other one. In this article, we deal with the strategy adopted to test the AGPS-control system (AGPS-CS), which is the medium-voltage switching power conversion system of the AGPS. A special dummy load has been designed for the commissioning. Simulation models have been developed to verify the capability of the dummy load to reproduce the AGPS-CS nominal working conditions. Simulations have been then validated against the experimental data gathered during the on-site tests, giving confidence about model predictions.