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## Fri-Af-Po.04-05: Research on the Design Method of Flexible Connection of High Current Bipolar Busbar for Superconducting Magnet Power Supply of Fusion Device

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In the design of DC busbar flexible connection in Power Supply System of CRAFT (Comprehensive Research Facility for Fusion Technology, China), water-cooled aluminum busbars interconnections are connected through aluminum flexible connectors to compensate for thermal expansion and installation deviation. As the contact surface between the DC busbar and the flexible connection is very small, the current flowing through is as high as 30 kA, and the power consumed in the contact surface is about 900W. During long-term high current operation, the flexible connection will cause contact overheating. This paper firstly introduces the different designs of high current bolted busbar, then presents the calculation method of busbar contact resistance, simulates the heat transfer at the flexible connection of busbar through ANSYS software, and calculates the temperature distribution of flexible connection. Finally, the temperature rise experiment is carried out and compared with the simulation results. Confirmed the design scheme for busbar connection. The effectiveness of the design is verified.

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