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DC Networks for the Powering of the FCC

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In recent years, with the advent of power electronics, DC networks have emerged as a promising solution for the distribution of electrical energy. They offer advantages in terms of efficiency, controllability, volume reduction, and integration of energy storage. Given the specific needs of the FCC, DC networks could be utilized to supply power to specific machine components.

On a larger scale, DC networks could facilitate power transfer around the machine's circumference, reducing the required cable size and enhancing control over active and reactive power. However, it is essential to compare DC networks with other AC technologies, such as the Unified Power Flow Controller and the Static Var Compensator, to fully grasp their benefits. At the access point level, DC networks could minimize the number of conversion stages, thereby increasing overall efficiency. Furthermore, the use of high-frequency transformers and DC cables with lower voltage drops could help reduce the required volume.

This presentation will explore the available technologies for constructing such networks and address the primary challenges involved in building the grid. It will also present several proposals for implementing this technology in the FCC, along with an analysis of the advantages and disadvantages of its use.

Author: COLMENERO MORATALLA, Manuel (CERN)

Presenter: COLMENERO MORATALLA, Manuel (CERN)

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