Abstract:

High-current variable-voltage (HCVV) rectifiers are used in the metal and chemical industries. Typical power ratings vary from tens of kW to hundreds of MW. The main issues with state-of-the-art rectifiers are poor input power factor, high current harmonic distortion, high-maintenance cost, high weight and large volume. To tackle these issues, a two-pronged approach is taken. First, the power quality issues of thyristor rectifiers are addressed with the help of passive and hybrid filters. Second, completely different, medium-frequency transformer-based topologies are proposed for the HCVV applications. In this colloquium both approaches shall be discussed along with the present state of the art rectifier technology.