



Contribution ID: 262

Type: **Poster Presentation**

## Development of a Discharge Circuit for High Voltage DC Power Supplies

*Tuesday 5 June 2018 13:30 (1h 30m)*

High voltage DC (HVDC) power supplies require a discharging circuit at their output terminals to dissipate the energy stored in the output filter capacitors when the unit is turned off. This helps to improve the operator safety while connecting and disconnecting loads to the HVDC power supply. There are varying safety standards covering this aspect with most of them requiring that the output voltage be discharged to less than 60 V in 1 sec after the unit is turned off. A high voltage discharge circuit was developed with series connected MOSFETs and discharge resistors. A reliable triggering method without transformer coupling is implemented by inserting a capacitor between gate terminals of series connected MOSFETs. The developed circuit has been tested with a 4000 V DC power supply and the results are presented. Various parameters that limit the end discharge voltage from going below 60 V are discussed. These include gate to source voltage of each MOSFET, value of the coupling capacitance, value of load discharge resistor and the turn on  $dv/dt$  of the first MOSFET in the stack.

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**Session Classification:** Poster 2 - High Voltage Design and Power Modulator Components