Auctioneering Diodes: Pros and Cons

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August 14-16, 2019  
Arlington VA
Asymmetric Auctioneering Diodes

Uninterruptible power to load if either source faults
Asymmetric Auctioneering Diodes: Multiple Loads

Multiple return paths result in common mode currents

Need circuit protection to avoid single point of failure
Symmetric Auctioneering Diodes

Eliminates multiple return paths and associated common mode currents
Symmetric Auctioneering Diodes: Double Ground Fault

Voltage doubles on double ground fault
Diode Snubber
Diode Snubber

Limit initial spike to a value diode can tolerate

\[ R_s = \frac{V_a}{i_{RR}} \]

Minimum capacitance (critically damped)

\[ C_s = \frac{4L}{R_s^2} \]

Minimum capacitance (Avoid interaction with \( C_p \))

\[ C_s > 3C_p \]
Diode Snubber

\[ V_a \quad \rightarrow \quad C_p \quad \rightarrow \quad D \quad \rightarrow \quad L \quad \rightarrow \quad i_L \quad \rightarrow \quad V_b \]

Fault Switch

Graphs showing waveforms for different parameters.
Summary

• Asymmetric Auctioneering Diodes
  • Great for single loads
  • Issues with multiple loads
    • Requires circuit protection
    • Common mode currents

• Symmetric Auctioneering Diodes
  • Eliminates common mode issue of Asymmetric configuration
  • Still requires circuit protection for multiple loads
  • Voltage doubling issue with double ground faults

• Diode Snubbers
  • May be required due to reverse recovery current of diodes