

A FAST, 3 MV MARX GENERATOR FOR MEGAVOLT OIL SWITCH TESTING  
AND INTEGRATED ABRAMYAN NETWORK DESIGN

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ABSTRACT

The University of Missouri-Columbia has a new test facility online to study oil breakdown of enhanced and uniform gaps. The 3 megavolt Marx generator is operational with switch configurations tested including large electrode gap spacings with point-ball electrodes. The test results from these experiments will be reported along with a conceptual design for a simple modification which will allow a rectangular pulse to be applied to the sample under test. By reverse-discharging a fraction of the Marx stages in parallel with an inductor of an optimized value, the pulse width increases dramatically at a minimal cost to the pulse amplitude. The cost-effective addition of a single inductor will be compared to the efficiencies of traditional pulse-forming networks. This thesis will also discuss the Abramyan network versatility with respect to altering pulse amplitude and width using a simple modification to the inductor. Benefits for system implementation will be presented.