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Improved High Voltage Pulse Generator for Automated Insulator Fault Detection

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Insulators that have suffered invisible damage can cause catastrophic system failure. Detection of the fault through visual inspection is not possible. An automated non-destructive test method is preferred. We have developed a system capable of a peak pulse voltage > 50 kV with fast rise time and limited pulse energy coupled with a high speed FPGA processor to analyze the output voltage and current for potential insulator faults. This paper will discuss the design and test results of this high-voltage pulse generator with automated fault detection.

This pulse generator has been improved using a new high-voltage solid state switch based on thyristors capable of >100 A/ns and >300 V/ns. Using this switch increased the efficiency by 25% versus an IGBT based switch. This paper will also discuss the design and test results of this new switch.

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