The processor is able to determine a fault within 30 ms using solid state switching and an FPGA which records the data through isolated digital interface from a two channel 20 MHz ADC. The energy per discharge is limited to about 0.4 J. We developed an automated insulator fault detection system that was able to detect 100% of faults when they were present. The thyristor based switch, the S70-2-8, achieved improved performance with a new IGBT based switch. The insulators were also tested with the electrodes right on the insulator and using an increasing number of pulses. This would cause the silicone rubber to degrade, effectively burning a channel through. The insulators were also tested with the electrodes located 0.75" apart, close enough that they will arc if the insulator was not present. The arc would form through the hole in the insulator that it would generate an arc through the insulator. As the arc formed through the hole in the insulator, the voltage across the electrodes would drop quickly compared to a test with no hole.

The insulators tested had various hole sizes drilled through them, though the rubber tended to close up for the smaller hole sizes.

As the silicone rubber started to degrade, the peak voltage across the electrodes fell as some energy was transferred resistively through the insulator. Eventually the insulator was damaged sufficiently that it would generate an arc through the insulator. As the silicone rubber started to degrade, the peak voltage across the electrodes fell as some energy was transferred resistively through the insulator. Eventually the insulator was damaged sufficiently that it would generate an arc through the insulator.

The thyristor based switch, the S70-2-8, achieved a faster turn-on time to a lower on-state voltage than the equivalently packaged IGBT based switch achieving higher output voltage and therefore a more efficient test.

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