When a fault is occurred from a transmission line at a distance that ranges from 100 m to a few kilometers along the lines, a circuitbreaker is required to clear the SLF. When a CB clears the SLF generated on the line, TRV with a steep rate of rise similar to a saw tooth waveform is observed due to high frequency oscillation generated by the propagating waves that iterate traveling on the line and reflections between the circuit breaker terminal and the fault point.

When the circuit breaker interrupts the fault current on the SLF conditions, the voltage of the circuit-breaker terminal at the source side is back to the system voltage at the transformer terminal which causes an oscillation with the power frequency in the source circuit.

On the other side, the voltage of the circuitbreaker terminal at the line side is dropped to the grounding levels, which creates another oscillation with a saw tooth (triangular) shape due to traveling and reflection of propagating waves along the line. The line side circuit can be approximated with a small attenuated circuit with distributed parameters.

Figure shows TRV wave forms across circuitbreaker terminal & line side.