Very Fast Transient Over voltage (VFTO) wave common characteristics in HV & EHV GIS

- Steep wave front, for which the rise time is usually 2–20 ns: when re striking occurred to the contact clearance of disconnector, the arc striking process is very rapid; thus, the voltage waveform that injected into the network has very high ascending or descending steepness.
- Theoretically, the amplitude of VFTO can be up to 3.0 p.u. This extreme condition is generated when the polarities of voltage on both sides of the branch being open are reverse and both are the maximum values. Considering the actual reasons, such as residual voltage, damping and attenuation, the VFTO obtained in actual measurement or simulation test does not exceed 2.0 p.u. in most cases. Considering the worst case, the maximum overvoltage can be up to about 2.5–2.8 p.u.
- The VFTO has a lot of high-frequency components, within the range of 30kHz–100MHz. This is because that GIS uses SF6 gas as the medium, with insulation strength well above that of air.
- VFTO is closely related to the restriking and arc quenching moments of GIS disconnector and position of the disconnector nodes in GIS equipment.

Pic show a example of VFTO waveform in 750 KV GIS.