



Contribution ID: 513

Type: Oral

Characteristic Analysis of Metal Oxide Resistor under Impulse of Different Wave-Head Time

Monday 24 June 2019 10:15 (15 minutes)

ABSTRACT: This paper determines the waveform parameters of metal oxide varistor (MOV) test platform according to the IEC standards and the waveform characteristics of very fast transient overvoltage (VFTO) measured in gas-insulated metal-enclosed switchgear (GIS). The standard lightning impulse test circuit with 8 μ s wave-head time, the steep wave impulse test circuit with 100ns wave-head time and the very fast transient overvoltage impulse test circuit with 20ns wave-head time are designed and constructed respectively. Several typical MOVs used in 10kV and ultra-high voltage arresters are selected as samples. The volt-ampere characteristics of MOVs under the above three different wave-head time impulses are studied experimentally. The experimental results show that the residual voltage of MOV increases by 14.7% to 18.2% under the action of 20ns very fast transient overvoltage impulse compared with the standard lightning wave and the steep wave with the same amplitude. Under the action of standard lightning impulse with 8 μ s wave-head time and the steep wave impulse with 100ns wave-head time of different amplitude, the voltage of MOV reaches its peak value earlier than current, showing the characteristics of inductance. Under the action of 20ns very fast transient overvoltage impulse, MOV has an obvious impedance transition voltage U_0 . Under U_0 voltage, MOV shows resistance characteristics. When the peak voltage is less than U_0 , MOV shows capacitive impedance characteristics. When the peak voltage is greater than U_0 , MOV shows inductive impedance characteristics. U_0/U_{1mA} has little relationship with the shape and size of MOV.

Author: ZHANG, Wei (Xi'an Jiaotong University)

Presenter: ZHANG, Wei (Xi'an Jiaotong University)

Session Classification: 10.1/10.2 Converters, Components, Magnetics, Switches and Capacitors

Track Classification: 10.2 Components, magnetics, switches, capacitors