

The Transient Measurements by Voltage Transformer (VT) Based on Non-linear Model

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February 20, 2023

Abstract

Transient measurement is expected to be widely required in the future power system. One of the the most cost-effective ways to widely equip the power system with the transient measurements is to upgrade current voltage transformers to be enabled with transient measuring ability. This paper presents a algorithm-based technique involving the non-linear features of VT to enable CVT and PT with a wideband transient voltage measuring ability, including the methods of building the non-linear transient model and inverse calculation method based on the output voltage to recover the input voltage waveform. In this paper, the method of synthesizing the equivalent circuit model for a PT or a CVT is presented in detailed. Meanwhile, the inverse calculation method based on circuit theories and Bergeron equivalence as well as NR equivalence is also presented. The verification experiments were performed on a 110kV CVT and 10kV PT with the lightning impulses as the verification source. The experimental results show a good match to the input waveform recorded by standard divider.

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