

Title: “Recommended Practice for Preferred Ratings for High-Voltage (>1000 volts) AC Circuit Breakers Designated “Definite Purpose for Fast Transient Recovery Voltage Rise Times””.

Scope: “This recommended practice supplements IEEE Std C37.06 for high-voltage circuit breaker applications where the transient recovery voltages rise to the crest value more rapidly than those specified in IEEE Std C37.06”

Meeting held at Hyatt Convention Center in Denver, CO

Chair: Keith Wallace
Vice Chair: Bill Bergman

Introductions of attendees were made.

IEEE Patent slides were reviewed by the working group.

PC37.06.1 PAR has been approved.

Keith Wallace presented the derivation of TRV values from the original NEMA C37.06.1 standard (later transferred to IEEE). The original values in the NEMA C37.06.1 were based on tests on over a hundred transformers. An IEEE paper “Transient Recovery Voltages Associated with Power-system, Three Phase Transformer Secondary Faults” by R. H. Harner and J. Rodriguez (S & C Electric Company) – paper T 72 112-6 was recommended and approved by the IEEE Switchgear Committee. This presentation is attached as Annex 1 to these minutes (F09HVCBax1).

Dennis Dufournet presented the derivation of TRV values that were developed for the proposed C37.06 “Annex C” (but not included) in the recently approved C37.06 This Annex C development included the conversion of transformer limited faults to the two- and four-parameter basis with the intention of harmonization with the IEC descriptions of TRV envelopes. The presentations are attached to these minutes as Annex 2 “Revision TLF_Dufournet” (F09HVCBax2) and Annex 3 “Proposed revision of Tables for Definitive Purpose circuit breakers” (F09HVCBa3).

Ken Edwards presented a review of TRV requirements at a range of voltages from 123 to 800 kV at T10 and T30. This spreadsheet also shows the comparison of TRV values at T60 and T100 for several editions of IEEE and IEC standards. It is included as Annex 4 of these minutes “TRV graph 09-12-09” (F09HVCBax4).

The goal of this PC37.06.1 revision is to be able to apply and select circuit breaker special TRV characteristics that meet a wide range of applications while minimizing the range of testing to prove compliance and capabilities.

The revision will include a change from the 1-cosine to a two parameter envelope. The WG needs to decide on:

- whether to use the existing 7% or use 10%
- decide on whether to limit special TLF at 30% of rating or some other appropriate value
- decide on whether preferred ratings should be shown as a percentage of circuit rating (such as in the existing C37.06.1) or as specific currents (such as was in the proposed Annex C to the newly revised C37.06 or as R10 series of values).

There is a need for WG members to provide information on realistic transformer limited fault values and to provide input to the WG chair much prior to the next Switchgear meeting in Myrtle Beach, SC in April 2010.

This standard needs to include situations where the fault current is limited by inductance in the presence of very little capacitance, i.e. switching of transformer limited faults, reactor limited faults, etc.

Roy Alexander suggests reviewing existing C37.06.1-2000 TRV values for fault current at ~60% of circuit breaker short circuit rating.

There was general consensus that there was no technical basis for assigning the fault current as a percentage of the circuit breaker interrupting rating. There is some rational for selecting values from the R10 series and letting manufacturers decide on what values to test against. There does; however, need to be an acceptable means of validating the circuit breaker with its test values for application with actual transformer limited fault values.

Dennis Dufournet presented the rational for the special TRV values subsequent to the WG meeting and those values are attached to these minutes as Annex 5 "Proposed Table of Preferred TLF Ratings_2009-10-01" (F09HVCBax5).

Recorded by
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