

Chair: Keith Wallace

Meeting Location

Orlando, FL

1. Introductions of all attendees
2. Attendance list circulated
3. The IEEE Patent slides were reviewed
4. Goal is to produce a draft by next meeting that can go to ballot
5. C37.06.1 was initially a “trial-use” standard. It will be revised as an IEEE Guide
6. Existing Table 3B has values for T30 and T7. The proposed fast T2 values were chosen to meet 90% of the applications.
7. Values were established from the old S&C tables supporting C37.011 (90<sup>th</sup> percentile of all transformers tested back then). Sample size was very limited in some transformer sizes/voltages.
8. Transformer capacitance, (and other capacitances in the near vicinity) determine the fast transients in transformer limited faults. The rating of the circuit breaker does not influence the fast transient.
9. A soon-to-be-published EPRI study shows that newer transformers have different natural frequencies. The result is that capacitances are much smaller than what is being used in circuit breaker applications.
10. Concerns:
  - Loss of circuit breaker capability
  - modern transformer capacitances appear to be smaller than estimated by Figure B1
  - more complicated application process
11. Discussion:
  - Studies by RBJ Engineering indicate that only in about half the studies will be circuit breaker meet the TRV application.
  - Southern Company would use a definite purpose circuit breaker rather than add TRV capacitors (which are another reliability issue).
  - EPRI study on “improved modeling of autotransformers for TRV modeling” will be released in next several months. EMTP studies based on BC Tran model [scanned from about 20 Hz to several MHz] [Randy Horton (EPRI)] Shows that conservatism thought to be in the C37.06.1 TRV is not there.
  - Transformer capacitance controls TRV application with other equipment relatively negligible (insulators, bus, etc.).
  - Typically, the lowest resonant frequency is the lowest controlling frequency.
  - SFRA Doble test sets scan from 20 kHz to 2 MHz. If the test is set up specifically for gathering TRV information (alternate lead arrangement), the SFRA test can yield useable results.
12. TF to determine transformer natural frequencies

- A vote was taken of the attendees in favour (32), against (0), and abstain (1) for forming a TF
  - Shawn Patterson, Cory Johnson, Daryl Hallmark, Randy Horton volunteered for this TF
  - Description of modified FRA test is available fro Ken Edwards
13. Motion to proceed with developing guide with 30% and 10% and to convert the 1-cosine curve to two-parameter curve, and not include work on the review of new TRV capacitance (in the interests of continuing the PAR)
- The results in support of developing the guide with 10% and 30% (23), opposed (2), abstain (0) as determined by a role call vote.