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To Mark Perkins/StLouis/USTRA/ABB@ABB, Subhash Tuli <subhash.tuli@ieee.org>,
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Please respond to
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cc

Subject Results of WG Straw Ballot - Modified Temperature Test

The straw ballot failed at having sufficient responses to be valid - only a 66% return after several solicitations for response. I have provided the responses below for your review and recommendations. I will be sending the WG a separate email informing of the ballot results.

Ballot results:

25 of 38 ballots returned: 7 approved, 2 approved with comment, 15 negative and 1 abstention.

APPROVED WITH COMMENTS:

Sanjib Som 11/15/09

the phrase "hot spot rise" should be replaced by "hot stop winding rise"

In the final version please add the word temperature in front of the word rise where ever the word rise is used for the purpose of temperature

Dick Amos 11/24/09

I've modified the clause in two areas. In the first, I suggest "determined" because in some cases the mfrg may want to use measurements instead of calculations for TO and BO.. And, I think the intent is to make that determination for the time point just before shutdown.

I also suggest an addition to clarify the language for multi-winding transformers.

MODIFIED TEMPERATURE TEST

The modified temperature test may be used to verify the performance of the transformer when a full temperature test is not performed. Only one test is performed and that is done at the maximum nameplate MVA rating. The selection of tap changer positions, measurement points and setup parameters shall be made on the same basis as the normal temperature test at the maximum MVA position as specified in sections 11.1-11.4. The current in the transformer shall be the total loss current as defined in section 11.1, and this current shall be held for a minimum of eight hours, of which a minimum of six hours must be at a top oil temperature rise above 80% of the calculated value. **After this minimum duration, the top oil rise, bottom oil rise and average oil rise shall be (calculated) determined for the point in time immediately prior to shutdown.** The average winding temperatures shall then be measured after shutdown as described in clause 11.3, only at the total loss current. **For multi-winding transformers, the average winding temperature gradients of additional windings shall be measured by circulating current corresponding to the maximum nameplate ratings of the windings for one hour followed by the average winding temperature measurement as described in clause 11.3.** The measured winding temperature rise values shall be adjusted for the maximum nameplate currents and for any other adjustments per clauses 11.3 - 11.4. Oil samples for dissolved gas in oil analysis shall be taken before and after the modified temperature test. The estimated top oil rise, hottest spot rise and average winding rise (based on readings taken immediately before the shutdown) shall be determined. If any of these values exceed the 65 degree limit, then a full temperature test is required.

NEGATIVE

Bob Ganser 11/16/09

I do not approve of the proposed "Modified Heat Run" as written by the Task Force:

In principle, I do not like to modify the standard by limiting the complete test to that of estimate;

I am concerned with "abuse" or "self-interest" in concentrating on the reduction of time of the test rather than the attainment of the actual thermal performance of the transformer;

From a legal point of view, actual data is better than estimate because it limits interpretation of results in case of warranty or operating problems;

In my opinion, the savings in time is not significant considering the total amount of time necessary to complete the test per existing standard. This recognizes that the transformer must be completely assembled for the test.

In my opinion, I would think that most suppliers would perform the complete test rather than take the chance that they would have to repeat the entire heat run should the estimate exceed the temperature limits.

The complete test is definitive and can be used to contribute to the supplier's empirical data base for similar designs and calculation methods;

I would consider the option of performing the test on the maximum rating of the transformer.

Marcel Fortin 11/17/09

I strongly oppose to this new « quality control » test procedure. This test procedure is beyond the scope of C57.12.00 and C57.12.90. No production quality control special test procedure shall be included in the standard.

The temperature rise test is well defined and is a TYPE TEST to prove a design. No confusion shall be introduced by this *short cut MODIFIED TEMPERATURE TEST*. Only one type test, well defined and applied, shall be covered in the standard and be the same for any class of transformers (i.e. distribution vs power).

A manufacturer is always allowed to define its own "quality control" plan and particular "quality control tests". This shall not be part of a general product standard. Actual type and other tests properly cover the verification of the designs. Routine test allow checking if there is no construction defects on some products.

Jerry Corkran 11/17/09

Marcel has explained the situation well.

Yunxiang Chen 11/17/09

I do not see any benefit to introduce this modified method.

Subhash Tuli 11/17/09

I vote "Negative" for the proposed Modified Temperature Test.

The intent of the proposal has substantially drifted for the purpose it was originally intended for. Details listed in the proposal are too vague.

Gary King 11/10/09

I vote negative on this proposal. I do not see the benefit to adding this method into the test standard.

Stephen Antosz 11/24/09

I vote Disapprove. I do not feel this test should be added to the Standard.

Steve Snyder 11/25/09

I vote "Disapprove" on the basis that a quality control test should not be listed in the standards. I would change my vote to "Approve" if this proposal was an informative annex to C57.12.90.

Jitendra Mamtora.11/25/09

This equivalent to introducing temperature rise test as routine test. Modified temperature rise test is only to be included as special test to be carried out after agreement with supplier and purchaser.

Joseph Melanson 11/26/09

As an "Other" test I do not see a specified occasion that it would be used for.

Any "Quality Control" test should normally be a supplier defined test.

There have been occasions in the past where units have passed the ONAF test and failed the ONAN test (not frequently).

If a unit is set up for temperature test, it makes sense to me to perform top and bottom ratings. The only difference is the additional time.

Hasse Nordman 11/30/09

I vote negative for introducing this test as a normative test in the standard. Marcel very well explained my arguments, too.

I could imagine the modified test, clearly described and pointed out as a non-standardized test, to be included in an informative Annex of the standard. Then the possible application of it would be a matter of agreement from case to case separately.

Oleg Roizman 12/2/09

The answers to the following questions will be helpful in reviewing the vote:

- Does the Modified Temperature Test means the Modified Temperature Rise Test?
- What is the major deference/s between Standard and the Modified Temperature Test?
- What is the purpose of the Modified Temperature Test?
- Does the “performance of the transformer” means ‘thermal performance of the transformer’? If it does, would all the parameters as specified in IEEE Std C57.12.00-2006 s. 8.6 covered?

Bill Boettger 1/12/10

I vote "disapprove" on the basis that this quality control type test should not be listed in the standards. A possible better place for it would be as an informative annex, etc.

Juan Castellanos 1/13/10

- 1.- Why is a need of an alternative proposal to the standard temperature test? Should not be better to refer to the max MVA standard test?
- 2.- What does "maximum MVA position" mean? If it is referring to the tap changer position, then is not conforming to C57.12.90 section 11.1.2.1 a) which states "combination of connections and taps that give the highest average winding temperature test?
- 3.- The test total-loss-current should not be held constant during the test, but adjusted in order to keep constant total losses according to C57.12.90 section 11.
- 4.- The total loss run should be held until transformer thermal stabilization is achieved (8 hrs could not be enough). Otherwise, winding temperature measurement would be inaccurate.
- 5.- It is not clear which windings would be shutdown at the total loss run or at the 1-hr rated current. What does "additional windings" mean?
- 6.- From the previous concerns, the accuracy of the test is compromised, and therefore its results should not be compared to guaranteed limits.

Alan Darwin 1/22/10

I vote negative as the proposed test is a "quality" test.

A quality test is usually carried out on a routine basis to confirm that a transformer has been manufactured correctly.

Such a test should not be in the Standard other than on an informative basis for a User who wishes to carry out such tests on a specific contract. In which case the test and its details should be contained within the User's contractual specification.

I also disagree with some of the details of the proposed method of test, but that is not relevant for my negative vote.