

Meeting Minutes - Revised

Task Force Core Gassing and Grounding

July 11, 2014

Chairman: David Buckmaster, Secretary: Donald Ayers

The second on-line meeting of the task force took place on July 11, 2014.

The meeting was called to order at 10:00 a.m. EST by the acting chairman Phil Hopkinson in the absence of David Buckmaster. A roll call was made and 11 of the 18 members were in attendance so a quorum was established.

The minutes from the last meeting were reviewed with one modification. Mike Iman was moved from the visitor category to member category. Jeewan Puri made a motion and was seconded by Gary Hoffman to accept the minutes as amended.

Chairman David Buckmaster joined the meeting at 10:15 a.m. EST.

Phil Hopkinson then briefly reviewed his presentation on the cause of core gassing and recommended solutions. He reviewed the data obtained from a high gassing transformer before and after a shield was installed. The results showed much reduced gassing. Partial discharge and RIV data from another unit before and after shielding of the core also showed much improved PD performance.

A lengthy discussion was held on the level of PD needing to be detected to determine if core gassing was occurring. A level of 100 pc was proposed with a background level of 50 pc or lower. It had been shown that if PD was less than background, core gassing generally did not occur.

Susan McNelly questioned the 100 pc level compared with the IEEE level of 500 pc and here company's level of 300 pc. Tom Prevost suggest that if a problem existed, a level of 500 pc would detect it. Phil Hopkinson responded that his experience said that the levels need to be lower for detection of core gassing.

Tom Prevost said he thought a background of 50 pc would be difficult to reach by many manufacturers of distribution transformers. Phil Hopkinson said that he had been able to achieve this level with a filter on the incoming power supply. Steve Shull also commented on whether the low levels would be needed. Tom Prevost suggest that nano-level measurements would be enough. Phil Hopkinson said he found that gassing can be caused by micro-level values of PD.

A general discussion was held as to whether only hydrogen detection would be enough without the PD measurements. The answer was yes, but the unit would have to be on test for several days to produce enough Hydrogen to verify problem. It was agreed that most manufacturers would not want to tie up a test bay for days at a time.

Aniruddha Narawane asked why it was necessary to go to 150% voltage. It had been shown that if the PD did not increase relative to the voltage, this was a signature of core bubbles and gassing. The voltage rise between 100% and 150% was to verify this characteristic.

The proposed wording for section 6.7.2 of IEEE Std. C57.12.00 was discussed. After the last meeting, Phil Hopkinson and Ramsis Girgis discussed modification to the wording. The modified wording was discussed with the members. Steve Shull made a motion and Ramsis Girgis seconded to accept the

modified wording for inclusion in IEEE Std. C57.12.00. An amended motion was made by Gary Hoffman and seconded by Steve Shull to accept the language and then forward it to the Subcommittee on C57.12.00. The amended motion was accepted by a unanimous vote of members. It was also agreed that the Task Force would forward the approved text of section “6.7.2 Grounding of Core” to the Chairman of the Performance Characteristics Subcommittee to whom the Task Force reports, to send to members of the PCS for Survey along with the agreed upon PD test after it is approved by TF A copy of the accepted language are attached with these minutes.

The next part of the Tank Force’s task is to develop testing language for inclusion in IEEE Std. C57.12.90. Chairman Dave Buckmaster said he would try and set up another on-line meeting for August 1, 2014 to discuss this subject.

A motion was made to adjourn the meeting.

Respectfully submitted,

Donald E. Ayers
Secretary

IEEE C57.12.00 Section 6.7.2 on Core Grounds

6.7.2 Grounding of Core

In medium and high voltage applications of transformers with wound cores, the transformer core shall be properly grounded to the tank in order to prevent development of high voltage across the wound core loop due to capacitive coupling, hence, preventing the dielectric breakdown of the thin oil film between the core laminations and the initiation of PD and the generation of H₂ and other hydrocarbons.

In order to validate that the core will not be susceptible to such discharges during normal operation, a type test is defined in C57.12.90, Section 10.7.3 with acceptance criteria in 10.7.6.

Where agreed to by purchaser and manufacturer, radio influence voltage (RIV) measurements may be used in lieu of, or in conjunction with, apparent charge measurements.